

A Stereo-Atlas of Ostracod Shells

edited by R. H. Bate, J. W. Neale, David J. Siveter and
P. C. Sylvester-Bradley

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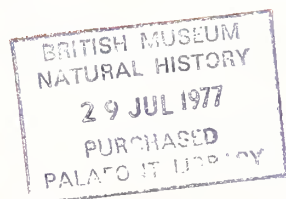
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Contributions illustrated by scanning electron micrographs of Ostracoda in stereo-pairs are invited. Full instructions may be obtained on request from any one of the Editors or Editorial Board. Format should follow the style set by the majority of papers in this issue. Descriptive matter apart from illustrations should be cut to a minimum; preferably each plate should be accompanied by one page of text only. Blanks to aid in mounting figures for plates may be obtained from the Editors.

Acknowledgments

This Volume of the *Stereo-Atlas* has been aided by generous financial support from Robertson Research International Limited.

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In order to obtain maximum information and benefit from the use of the *Stereo-Atlas* it is essential that the user view the micrographs stereoscopically. Small pocket-sized stereo-viewers are most suitable for this purpose. Two suppliers are:

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ON *CRYPTOPHYLLUS GUTTA* SCHALLREUTER

by Roger E.L. Schallreuter
(University of Hamburg, German Federal Republic)

Cryptophyllus gutta Schallreuter, 1968

1968 *Cryptophyllus gutta* sp. n. R.E.L. Schallreuter, *Paläont. Z.* 42, 1/2, 110, pl. 13, figs. 4 - 7.

Holotype: Department of Geological Sciences, University of Greifswald, Pomerania, German Democratic Republic, no. 40/4; an adult RV (without nauplioconch and second larva).

Type locality: Norderstrand Visby, Isle of Gotland (Baltic Sea); lat. 57° 40'N long. 18° 18.5'E. Öjlemyrflint erratic boulder (no. G2), Upper Ordovician.

Diagnosis: Adult valve length = 0.79mm. Umbo strong, outline therefore drop-like (= name). Maximum of 9 lamellae. Nauplioconch with a short spine. Inner surface with a very broad duplicature (only in adults) and an internal ridge (sulcament), corresponding external sulcus; sulcament consists dorsally of a sharp ridge which has a spine-like ventral termination and ventrally, at about valve centre, of a similar spine-like process or a less developed node-like thickening.

Explanation of Plate 4, 2

Fig. 1, RV, without nauplioconch, ext. lat. (SGPIH 1907, 735 μ m long); figs. 2, 3, RV (SGPIH 1906, 660 μ m long): fig. 2, int. lat.; fig. 3, ext. dors.

Scale A (250 μ m; x 92), figs. 1, 3; scale B (250 μ m; x 89), fig. 2.

Figured specimens: Geologisch - Paläontologisches Institut, University of Hamburg, nos. 1906 (complete RV: Pl. 4, 2, figs. 2, 3; Pl. 4, 6, fig. 1), 1907 (RV without nauplioconch: Pl. 4, 2, fig. 1), 1908 (LV with 6 lamellae only: Pl. 4, 6, figs. 2, 3), 1909 (juv. - 3 LV without nauplioconch and second larva: Pl. 4, 4, fig. 2), 1910 (complete juv. - 3 LV: Pl. 4, 4, fig. 3), 1911 (RV with 3 lamellae only: Pl. 4, 4, fig. 1), 1912 (juv. - 1 RV without nauplioconch: Pl. 4, 8, fig. 3), 1913 (fragmentary RV without nauplioconch: Pl. 4, 8, fig. 1), 1914 (fragmentary juv. - 1 RV without nauplioconch: Pl. 4, 8, fig. 2).

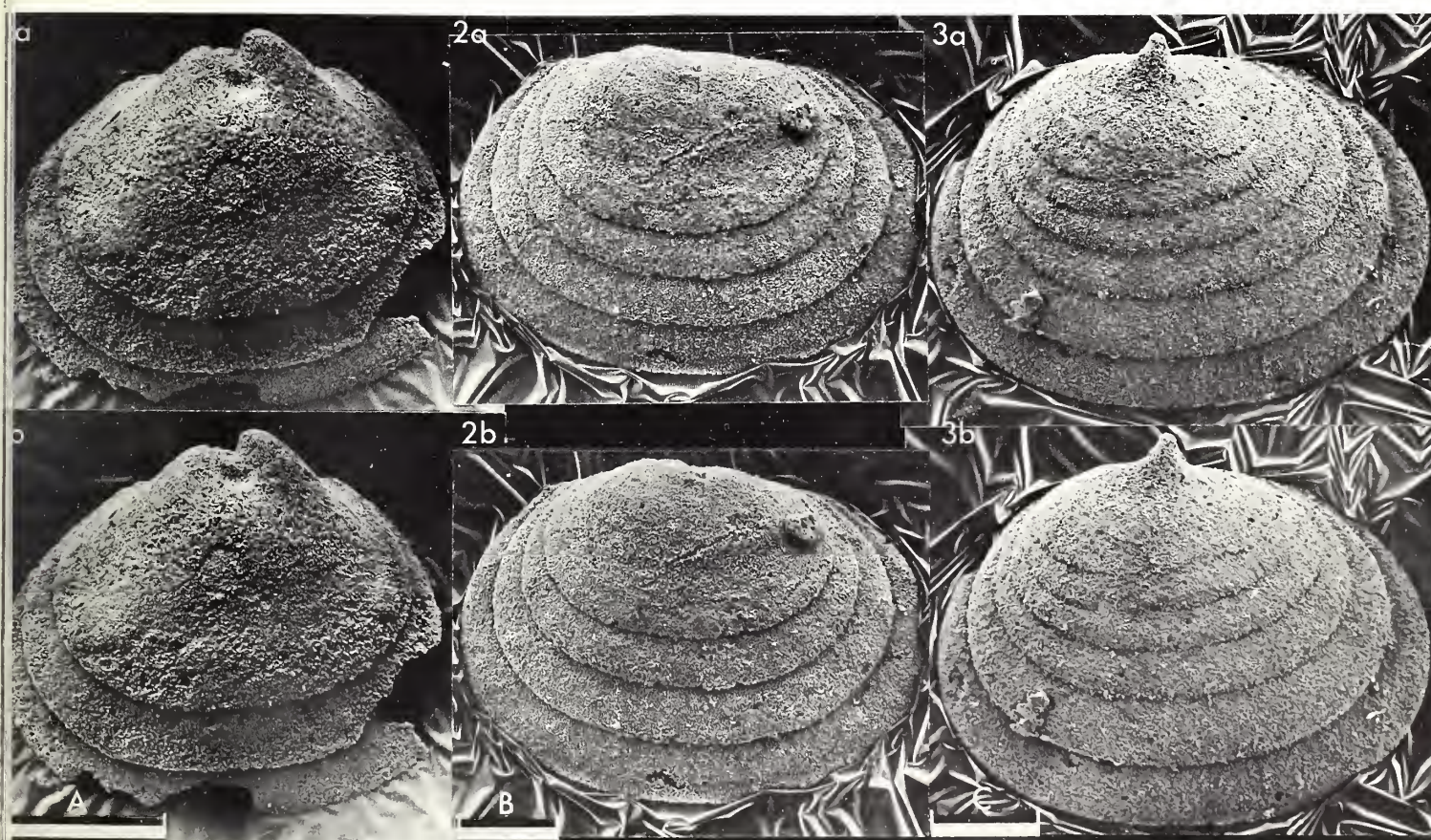
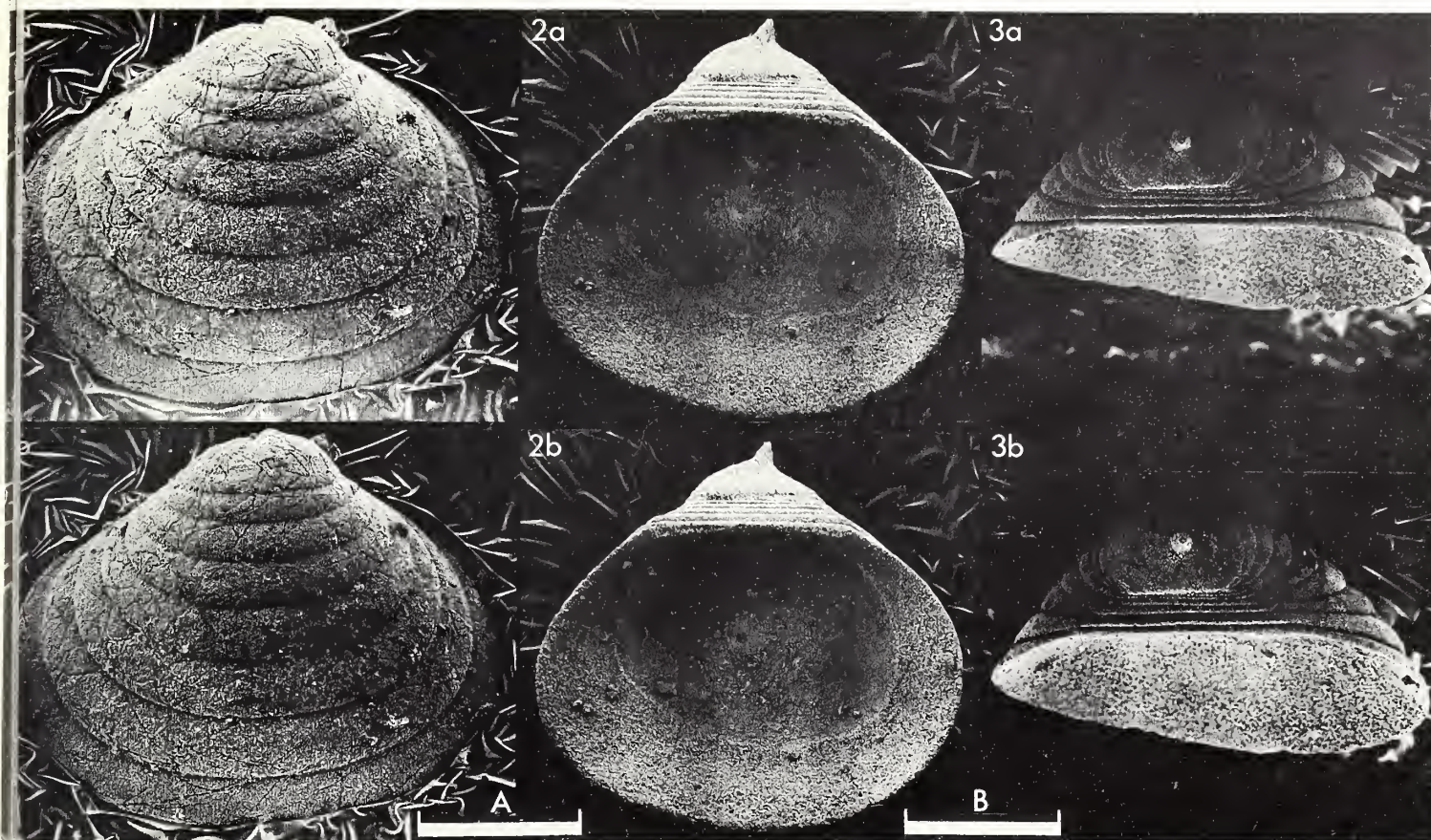
From the Isle of Gotland (Baltic Sea), Öjlemyrflint erratic boulders, no. G4 (1906, 1907; Licker-shamn: lat. 57° 49.5'N, long. 18° 30.5'E) and G9 (1908 - 1914; Gnisvårds: lat. 57° 30'N, long. 18° 7'E), Upper Ordovician; coll. by Horst Kaufmann, 1974 - 75.

Remarks: Some of the features cited in the diagnosis are probably not only characteristic for the species but also for the genus as a whole. The discrimination of many *Cryptophyllus* species on the basis of published information is rather difficult. Even the affiliation of the Eridostraca (to which *Cryptophyllus* belongs) to the Ostracoda has been questioned by some authors (Schmidt, *Abh. senckenb. naturforsch. Ges.* 454, 18, 1941; Hartmann, *Z. Zool. Syst. Evolut. -forsch.* 1, 5, 146, 1963; Gorak, *The Fauna of the lowest part of the Tournaisian (zone C₁^ta) in the Donetz Basin*, 106, Kiev, 1966; Jones, *Bull. Bur. Miner. Resour. Geol. Geophys. Aust.* 99, 1, 64, 65, 1968; Jordan, *Freiberger ForschHft.*, ser. C, 265, 28, 1970; Langer, *Palaeontographica*, Abt. A, 144, 38, 1973).

Explanation of Plate 4, 4

Fig. 1, RV, 3 lamellae only, ext. lat. (SGPIH 1911, 621 μ m long); fig. 2, juv. - 3 LV, without nauplioconch and second larva, ext. lat. (SGPIH 1909, 455 μ m long); fig. 3, complete juv. - 3 LV, ext. lat. (SGPIH 1910, 455 μ m long).

Scale A (250 μ m; x 98), fig. 1; scale B (100 μ m; x 143), fig. 2; scale C (100 μ m; x 152), fig. 3.



Remarks: The mechanism of growth in *Cryptophyllus* is shown in Pl. 4, 2, fig. 2 and Pl. 4, 6, figs. 1, 3. The new valve (contd.) develops a complete new hinge, rendering obsolete the previous hinge which migrates away from the contact plane. The lamellae of the younger instars do not therefore extend to the contact plane as in the forms of Eridostraca illustrated by Adamczak (*Acta palaeont. pol.* 6, figs. 1, 9A - E, 17, 20, 23, 1961), and there is no "innige Verzahnung der einzelnen Lamellen" (Langer, op. cit., 36). The complete separation of the two valves of the carapace at the dorsal margin is, according to Hartmann (op. cit., 8), a special feature of the Ostracoda.

Cryptophyllus gutta also has another structure typical of ostracods; a broad duplicature very similar to the inner lamella of *Oejlemys* Schallreuter, 1968 (*Wiss. Z. Univ. Greifswald*, 17, fig. 26.3). This feature provides strong additional evidence that the Eridostraca are true ostracods and, moreover, indicates affinities with the Podocopida. There are also some similarities in this respect in the morphology of the adductor muscle scar field (cf. *Cryptophyllus platyognus* Jones, *Bull. Bur. Miner. Resour. Geol. Geophys. Aust.* 62, 17, fig. 6f, 1962, and *Steusloffina cuneata* (Steusloff) in Hessland & Adamczak, *Geosci. Man.* 6, 60, pl. 3, figs. 1b - 2c, 1974).

Septum-like sulcaments are also known to occur in other ostracods (e.g., see Adamczak, *Stockh. Contr. Geol.* 17, 76, pl. 30, figs. 2c - e, 3c - e, 1968; Bonnema, *Mitt. miner. - geol. Inst. Reichsuniv. Groningen* 2, 1, 73, pl. 8, fig. 7, 1909; Blumenstengel, *Freiberger ForschHft.*, ser. C, 182, 73, fig. 23, 1965).

Explanation of Plate 4, 6

Fig. 1, RV, hinges and nauplioconch, ext. dors. (SGPIH 1906); figs. 2, 3, LV, 6 lamellae only (SGPIH 1908, 712 μ m long): fig. 2, int. dors. obl.; fig. 3, int. lat.

Scale A (100 μ m; x 220), fig. 1; scale B (250 μ m; x 90), fig. 2; scale C (250 μ m; x 79), fig. 3.

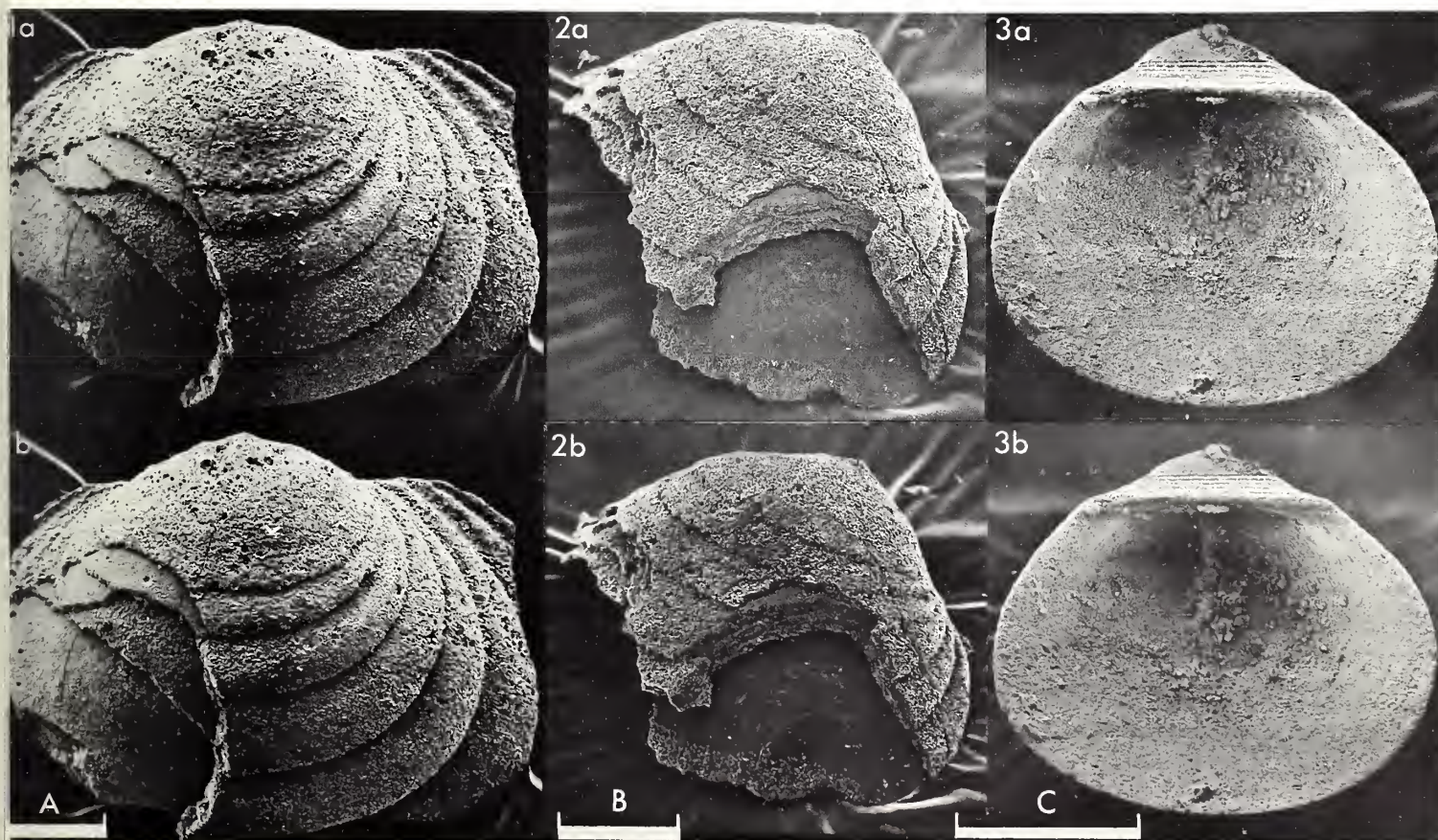
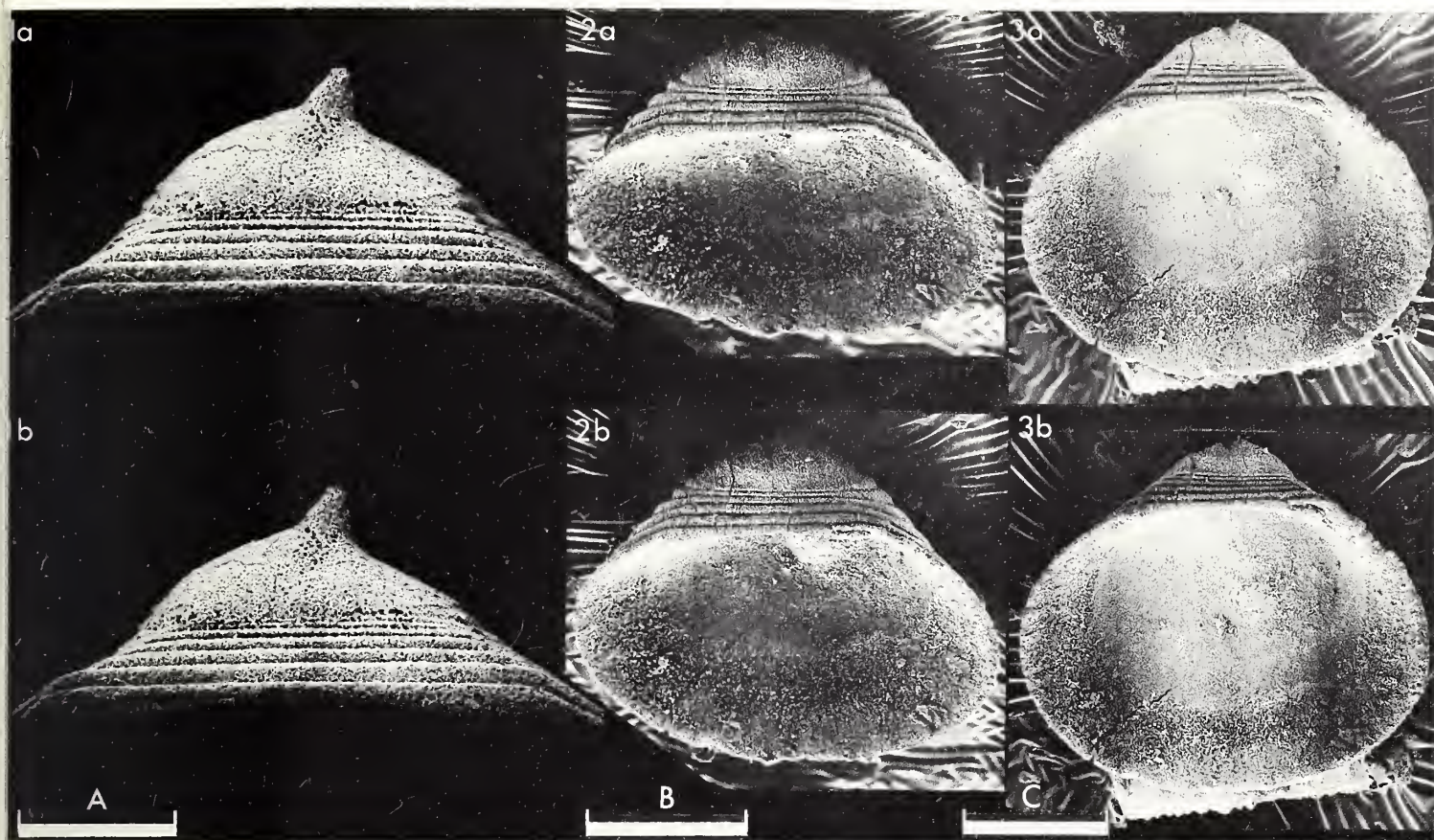
Remarks: Like most Recent ostracods, *C. gutta* has nine instars. Other *Cryptophyllus* species (especially post- (contd.) Ordovician) have more instars, the maximum recorded number being 15 (cf. Becker & Bless, *Internat. Symp. Belg. Micropaleont. Limits Namur*, Publ. 1, pl. 17, fig. 5, 1974). Evolution within the Eridostraca is characterised by the prolongation of ontogeny (insertion or addition of stages of development). Although some ostracods have a constant series of larval stages, a similar prolongation may still occur if earlier ontogenetic stages are lost as later stages are added.

Distribution: Isle of Gotland (Baltic Sea); Öjlemyrflint erratic boulders, Upper Ordovician.

Explanation of Plate 4, 8

Fig. 1, fragmentary RV, without nauplioconch, ext. lat. (SGPIH 1913, 462 μ m long); fig. 2, fragmentary juv. - 1 RV, without nauplioconch, ext. anterovent. obl. (SGPIH 1914), fig. 3, juv. - 1 RV, without nauplioconch, int. lat. (SGPIH 1912, 606 μ m long).

Scale A (100 μ m; x 159), fig. 1; scale B (100 μ m; x 165), fig. 2; scale C (250 μ m; x 101), fig. 3.



ON *MIEHLKELLA CRIBROPORATA* SCHALLREUTER gen. et sp. nov.

by Roger E.L. Schallreuter
(University of Hamburg, German Federal Republic)

Genus *MIEHLKELLA* gen. nov.

Type-species: *Miehlkella cribroporata* sp. nov.

Derivation of name: In honour of Dr. Otto Miehlke, Warnemünde, German Democratic Republic. Gender, feminine.

Diagnosis: A median-sized (to large ?) genus of Aparchitidae (suborder Leiocopa; see Schallreuter, *Geol. För. Stockh. Förh.* **95**, 37 - 49, 1973), without adventral sculptures. Outline \pm postplete. Right/left overlap; ventrally, the right valve has a contact groove and a wide contact ridge which overlaps the left valve. Muscle spot slightly anterior of centre. Surface with densely developed pores which on the inner side end as sieve-pores of a special type.

Explanation of Plate 4, 10

Figs. 1, 2, RV (holotype, **SGPIH 1915**, 768 μ m long): fig. 1, ext. lat.; fig. 2, ext. vent. obl.; fig. 3, fragmentary LV, int. lat., detail showing sieve-pores (**SGPIH 1916**).

Scale A (250 μ m; x 82), fig. 1; scale B (250 μ m; x 105), fig. 2; scale C (25 μ m; x 550), fig. 3.

Remarks: *Miehlkella* is characterised by a special type of sieve-pore, the first sieve-pores to be observed in any Palaeozoic ostracod. It resembles *Baltonotella* Sarv, 1959 (*Eesti NSV Tead. Akad. Geol. Inst. uurimused* **4**, 161 - 3) in its main features (right/left overlap, short straight hinge-line, missing adventral sculpture), but the type-species of that genus has an \pm amplete outline, a more anterior muscle spot and puncta which are relatively larger, less close together and more elongate than the pores of *Miehlkella* (op. cit., pl. 32, figs. 17 - 20; Bonnema, *Mitt. miner. - geol. Inst. Reichsuniv. Groningen* **2**, pl. 3, figs. 1 - 9, 1909).

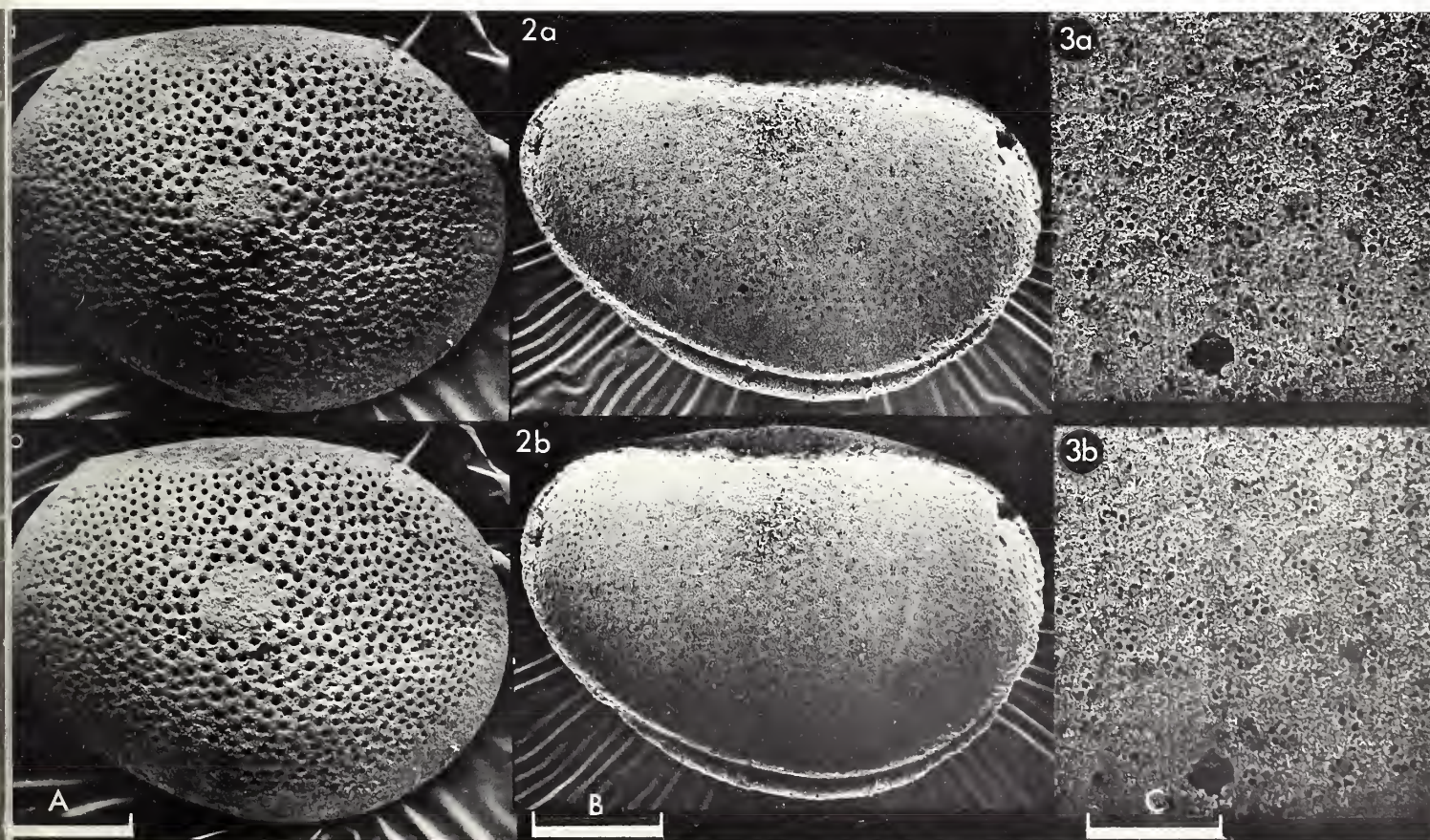
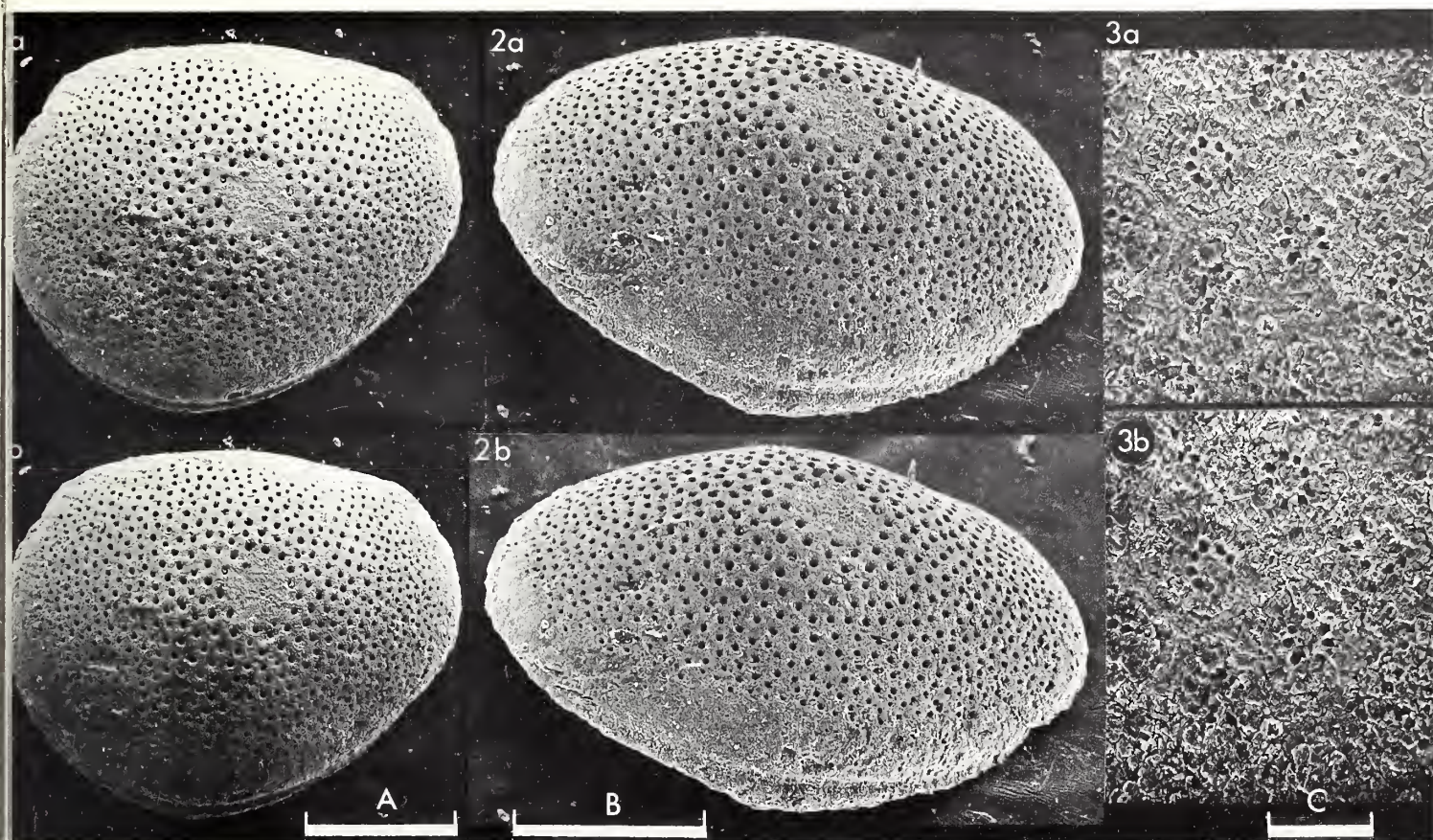
Hyperchilarina Harris, 1957 (cf. Schallreuter, 1973) also resembles *Miehlkella* in some respects (right/left overlap, short straight hinge-line, muscle spot near centre), but strongly differs by its \pm amplete outline and adventral sculpture.

Although similar, the genus *Bullatella* Swain & Cornell (in Swain et al., *J. Paleont.* **35**, 354, 1961; cf. especially pl. 47, figs. 1a - c) possesses a "pronounced midventral swelling and a low narrow ridge or row of spines adjacent to free margin of each valve." The type species of *Conchoides* Hessland, 1949, *C. micropunctata* Hessland, 1949 (*Bull. geol. Instn. Univ. Upsala* **33**, 149), is much larger, \pm amplete, and exhibits an indistinct and short step-like marking in the dorsal half of the anterior margin, a groove in the dorsal part of the posterior margin, a very shallow dorsoventral depression (S2), and a minutely punctate surface with scattered, larger puncta.

Explanation of Plate 4, 12

Fig. 1, LV, ext. lat. (**SGPIH 1917**, 863 μ m long); figs. 2, 3, RV (**SGPIH 1918**, 1000 μ m long): fig. 2, int. obl.; fig. 3, int. obl., detail showing sieve-pores.

Scale A (250 μ m; x 81), fig. 1; scale B (250 μ m; x 72), fig. 2; scale C (50 μ m; x 370), fig. 3.



Miehlkella cribroporata sp. nov.

Holotype: Geologisch - Paläontologisches Institute, University of Hamburg, no. 1915, RV.

Type locality: Beach at Dornbusch, Isle of Hiddensee (Baltic Sea); lat. 54° 36'N, long. 13° 7'E. Backsteinkalk erratic boulder (1B2 Type, no. 1B9), Middle Ordovician.

Derivation of name: Latin *cribrum*, sieve, and *porus*, pore; alluding to the sieve-pores.

Figured specimens: Geologisch Paläontologisches Institut, University of Hamburg, nos. 1915 (RV: Pl. 4, 10, figs. 1, 2; Pl. 4, 16, fig. 2), 1916 (fragmentary LV: Pl. 4, 10, fig. 3; Pl. 4, 16, fig. 3), 1917 (LV: Pl. 4, 12, fig. 1; Pl. 4, 16, fig. 1), 1918 (RV: Pl. 4, 12, figs. 2, 3), 1919 (RV: Pl. 4, 14, fig. 1), 1920 (LV: Pl. 4, 14, figs. 2, 3). From Backsteinkalk erratic boulders nos. 1B4 (1920), 28B1 (1919) and 1B9 (for further data see Schallreuter, *Palaeontographica*, Abt. A, 144, 65, 1973).

Diagnosis: As for the genus.

Explanation of Plate 4, 14

Fig. 1, RV, ext. lat. (SGPIH 1919, 871 μm long); figs. 2, 3, LV (SGPIH 1920, 866 μm long): fig. 2, ext. dors. obl.; fig. 3, ext. lat.

Scale A (250 μm ; x 74), fig. 1; scale B (250 μm ; x 70), figs. 2, 3.

Remarks: *M. cribroporata* is the only known certain species of the genus. One or more additional species are possibly concealed in material described by Hessland (op. cit.) and Sarv (op. cit.) under *Conchoides* and *Conchoprimitia* respectively. The most likely congeneric candidate is *Miehlkella ? meganotifera* (Hessland) (op. cit., pl. 2, figs. 1a - d) which, according to Sarv. (op. cit., 165), has *Conchoides ventropunctata* Hessland, *Conchoides dorsodepressula* Hessland and *Conchoides levis* Hessland as probable synonyms. *Conchoprimitia distincta* Sarv and *Conchoprimitia luxuriosa* Sarv also more probably belong to *Miehlkella* than to *Conchoprimitia*. All these questionable *Miehlkella* species are larger than the type species and occur in Lower Ordovician beds. Moreover, all of them apparently have a left/right overlap.

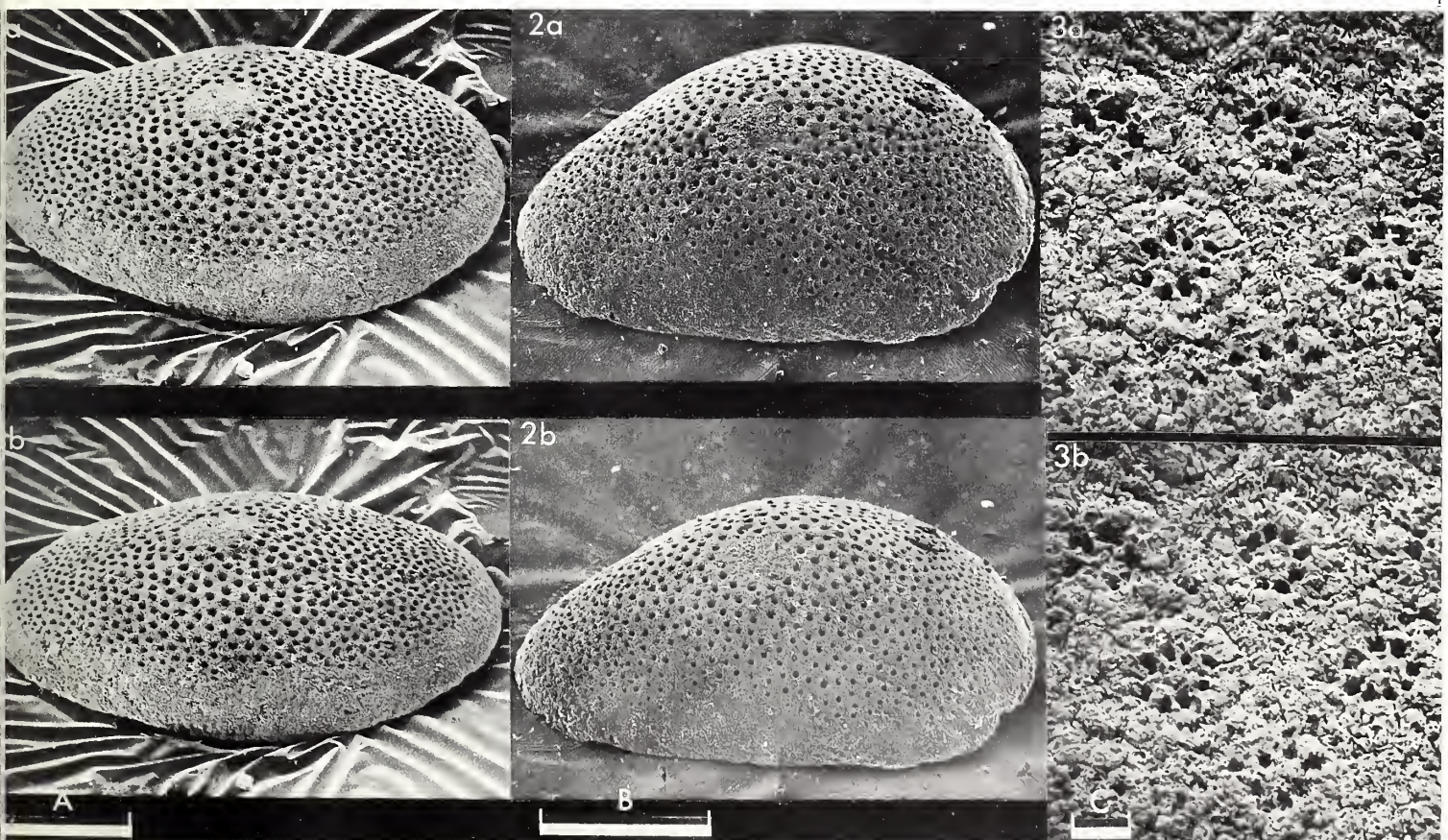
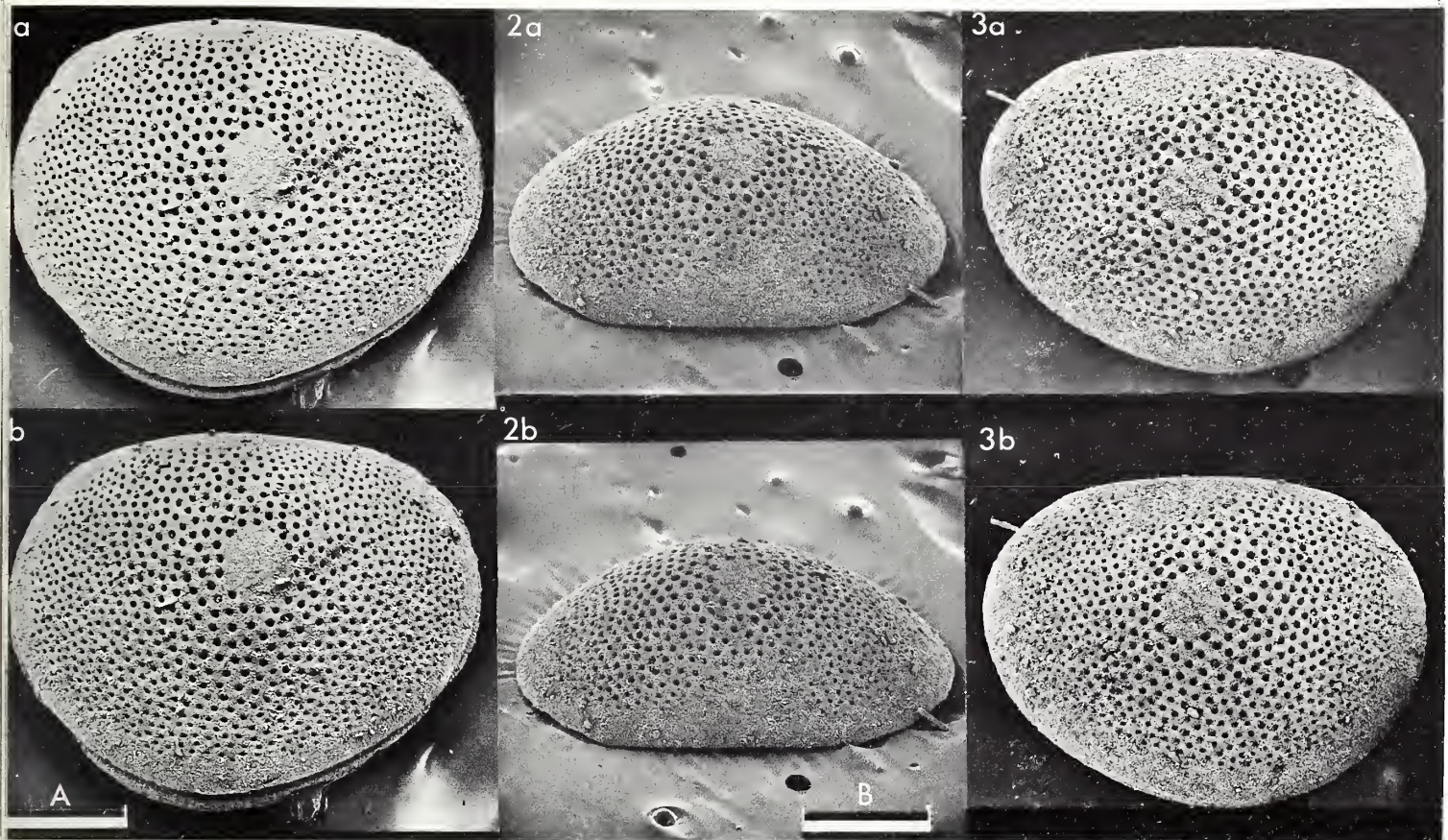
'*Bradoria* sp.' of Bolton & Copeland (*J. Paleont.*, 37, 1070, 1963), from the Middle Cambrian of western Canada, also resembles *M. cribroporata* (postplete outline, right/left overlap, no adventral sculpture, porate surface) but is larger (3.2 mm long) and possesses a muscle spot distinctly anterior of centre.

Distribution: Backsteinkalk erratic boulders of northern central Europe, Middle Ordovician (from the Upper Dalby and Skagen Limestones of Sweden and the Idavere [C₃]/Jõhvi Stages [D₁] of Estonia).

Explanation of Plate 4, 16

Fig. 1, LV, ext. vent. obl. (SGPIH 1917); fig. 2, RV, ext. dors. obl. (holotype, SGPIH 1915); fig. 3, fragmentary LV; int. lat., detail showing sieve-pores (SGPIH 1916).

Scale A (250 μm ; x 81), fig. 1; scale B (250 μm ; x 93), fig. 2; scale C (10 μm ; x 800), fig. 3.



ON *DISTOBOLBINA BISPINATA* SCHALLREUTER sp. nov.

by Roger E.L. Schallreuter
(University of Hamburg, German Federal Republic)

Distobolbina bispinata sp. nov.

Holotype: Geologisch - Paläontologisches Institut, University of Hamburg, no. 1921, ♀ LV.

Type locality: Beach at Lummelunds bruk, Isle of Gotland (Baltic Sea); lat. 57° 44.5'N, long. 18° 24.5'E. Öjlemyrflint erratic boulder (no. 791), Upper Ordovician.

Derivation of name: Latin *spīna*, spine; alluding to the two larger spines in the posterior half of the valve.

Figured specimens: Geologisch - Paläontologisches Institut, University of Hamburg, nos. 1921 (♀ LV: Pl. 4, 18, fig. 2; Pl. 4, 20, fig. 1; Pl. 4, 22, fig. 3), 1922 (♀ RV: Pl. 4, 18, fig. 1; Pl. 4, 20, figs. 2, 3), 1923 (♂ LV: Pl. 4, 18, fig. 3; Pl. 4, 24, figs. 2, 3), 1924 (♂ RV: Pl. 4, 22, fig. 1; Pl. 4, 24, fig. 1), 1925 (juv. RV: Pl. 4, 22, fig. 2).
All from Öjlemyrflint erratic boulder no. 791 (for further data see type locality).

Diagnosis: Adult valves c. 0.60 - 0.65 mm long. Preadductorial node tiny but distinct. Posteroventral lobule and centro-dorsal node extended into stout, posteriorly directed lobal spines.

Explanation of Plate 4, 18

Fig. 1, ♀ RV, ext. lat. (SGPIH 1922, 634 μ m long); fig. 2, ♀ LV, ext. lat. (holotype, SGPIH 1921, 642 μ m long); fig. 3, ♂ LV, ext. lat. (SGPIH 1923, 601 μ m long).
Scale A (250 μ m; x 98), figs. 1, 2; scale B (250 μ m; x 108), fig. 3.

Diagnosis: Tecnomorphic velum ridge-like or flange-like in anterocentral to centro- or posteroventral region. Dolon (*contd.*) strongly convex, forms two deep loculi, external surface striate.

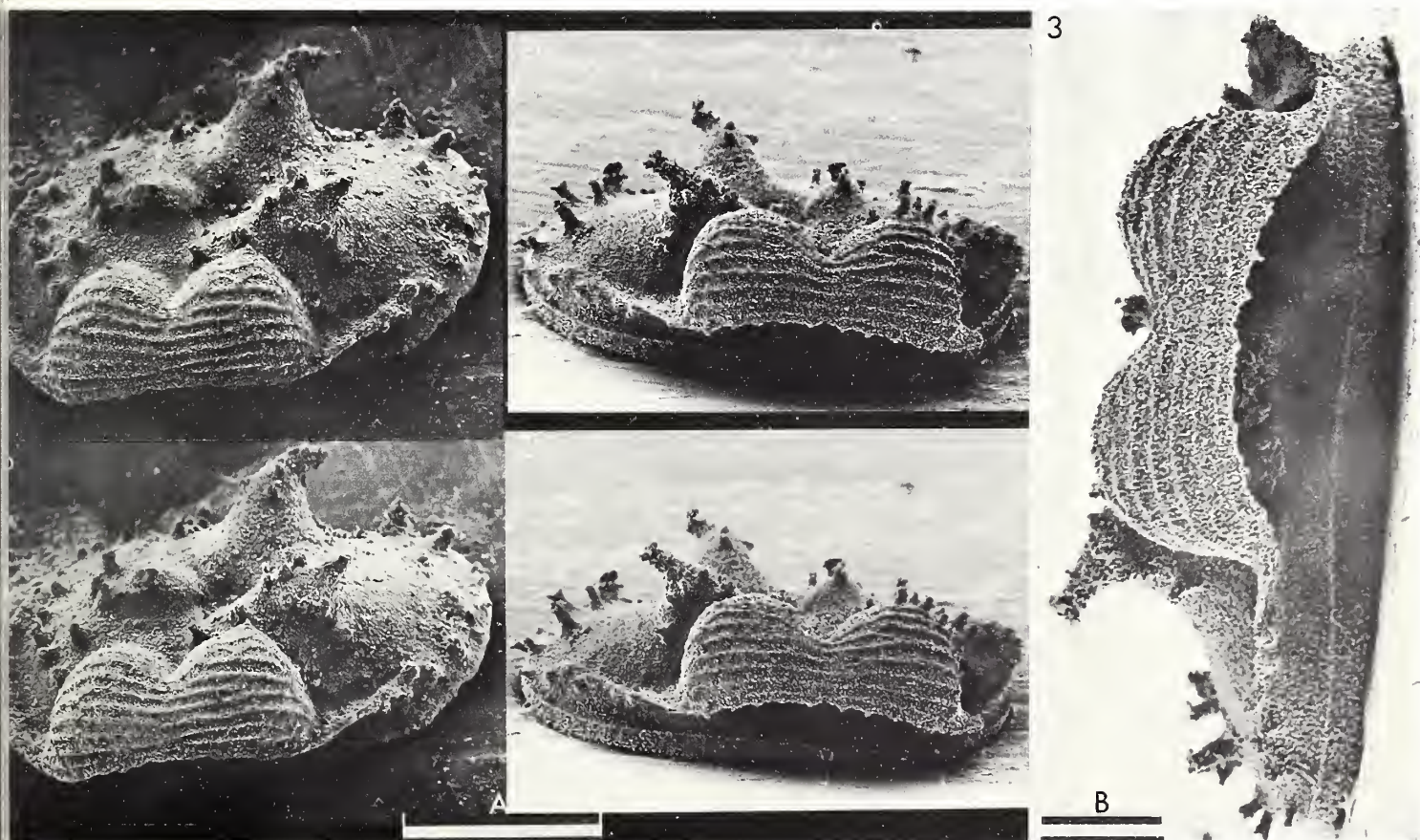
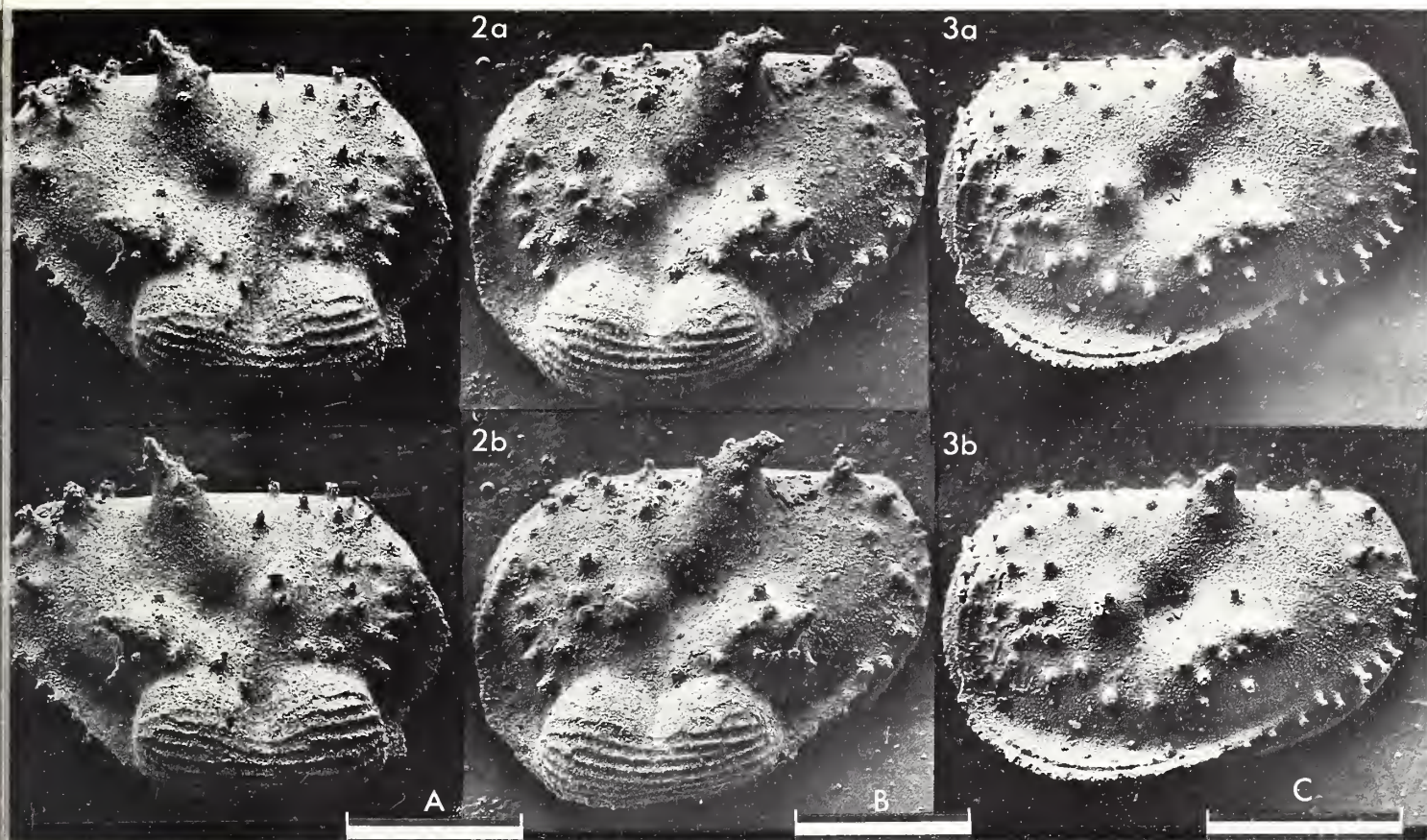
Remarks: As the name implies, *D. bispinata* is characterised by two strongly developed lateral lobal spines. Of the known congeneric taxa, *Distobolbina nabalaensis* Sarv, 1959 (*Eesti NSV Tead. Akad. Geol. Inst. uurimused* 4, 150) and *D. tuberculata* (Henningsmoen, 1954) (*Norsk geol. Tidsskr.* 33, 78) resemble the new species in most respects, especially in the morphology of the antrum and the dolon, which in both species houses two deep loculi and has a striate external surface. *D. nabalaensis*, the type species, can be distinguished by its much larger size (0.94 mm); according to Sarv it also has a small preadductorial node and a low node of uncertain form dorsal to S2. *D. tuberculata*, which can occur together with the new species, is somewhat larger (-0.78 mm long) and is characterized mainly by a single, stouter spine in the posterodorsal region and only a weak and indistinct preadductorial node. Furthermore, in *D. tuberculata* the tecnomorphic velum does not normally extend to the anterocentral region.

Distobolbina pinna Schallreuter, 1964 (*Ber. geol. Ges. D.D.R.*, Sonderh. 2, 90) is about the same size as *D. bispinata*, but its central dorsal spine is not more strongly developed than its anterodorsal and posterodorsal spines, and its dolon is non-loculate or only indistinctly loculate and therefore lacks a furrow marking the ventral prolongation of S2 (Schallreuter, *Palaeontographica*, Abt. A, 149, pl. 30(9), figs. 4 - 6, 1975).

Distobolbina grekoffi Schallreuter (*Stereo-Atlas of Ostracod Shells* 4, 25 - 28, 1977) is larger (c. 0.91 mm long) and has a botulate (= non-loculate) antrum and only a faintly convex dolon. Furthermore, in the males of that species the velum is developed ventrally as a row of spines, not a flange.

Explanation of Plate 4, 20

Fig. 1, ♀ LV, ext. vent. obl. (holotype, SGPIH 1921); figs. 2, 3, ♀ RV (SGPIH 1922): fig. 2, ext. vent. obl.; fig. 3, ext. vent.
Scale A (250 μ m; x 109), figs. 1, 2; scale B (100 μ m; x 169), fig. 3.



Distribution: Known only from the type locality.

Explanation of Plate 4, 22

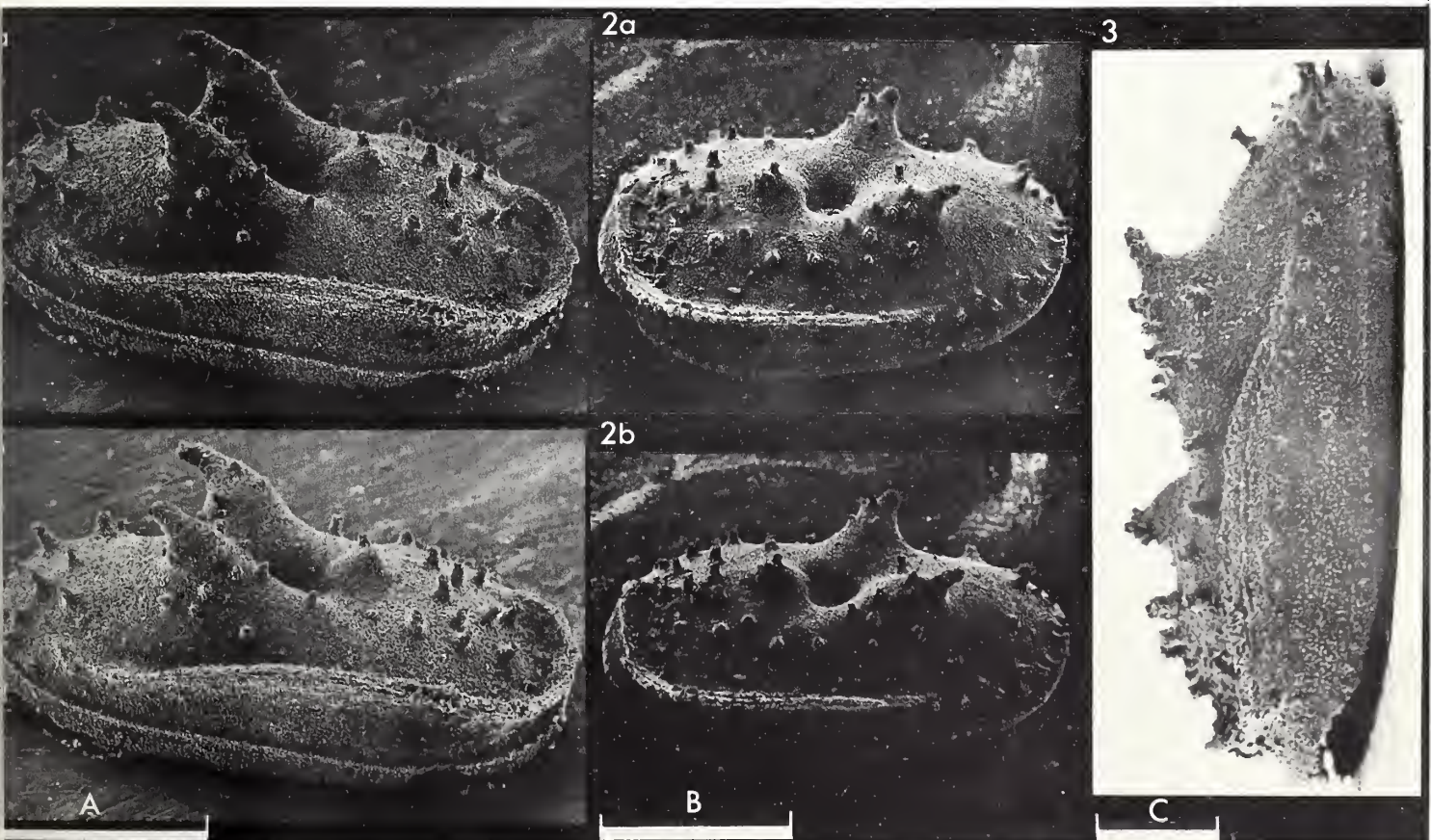
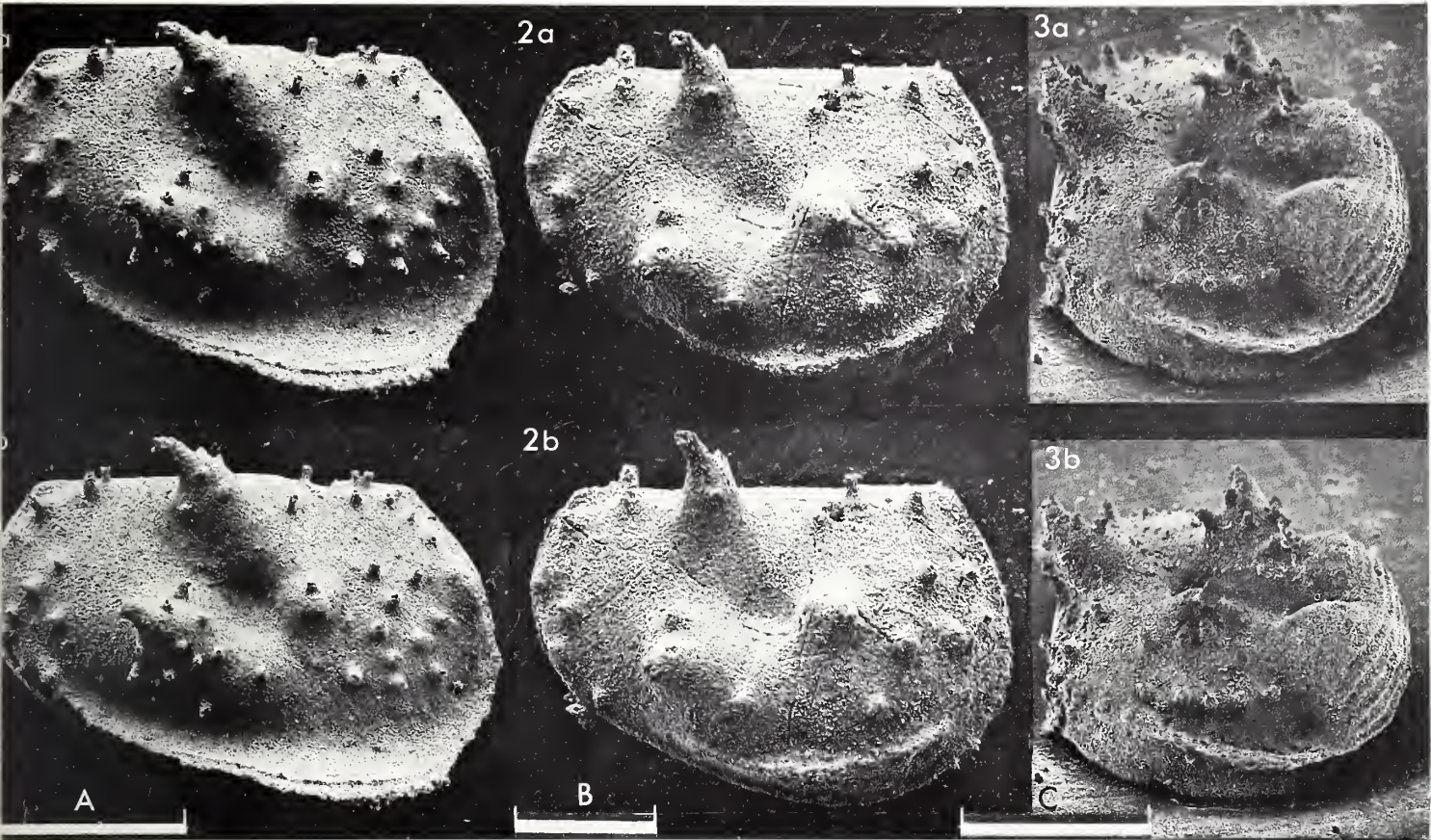
Fig. 1, ♂ RV, ext. lat. (SGPIH 1924, 635 μ m long); fig. 2, juv. RV, ext. lat. (SGPIH 1925, 355 μ m long); fig. 3, ♀ LV, ext. ant. obl. (holotype, SGPIH 1921).

Scale A (250 μ m; x 110), fig. 1; scale B (100 μ m; x 186), fig. 2; scale C (250 μ m; x 103), fig. 3.

Explanation of Plate 4, 24

Fig. 1, ♂ RV, ext. vent. obl. (SGPIH 1924); figs. 2, 3, ♂ LV (SGPIH 1923): fig. 2, ext. vent. obl.; fig. 3, ext. vent.

Scale A (250 μ m; x 126), fig. 1; scale B (250 μ m; x 105), fig. 2; scale C (100 μ m; x 163), fig. 3.



ON *DISTOBOLBINA GREKOFFI* SCHALLREUTER sp. nov.

by Roger E.L. Schallreuter
(University of Hamburg, German Federal Republic)

Distobolbina grekoffi sp. nov.

Holotype: Geologisch - Paläontologisches Institut, University of Hamburg, no. 1926, ♀ LV.

Type locality: Beach at Gnisvårds, Isle of Gotland (Baltic Sea); lat. 57° 30'N, long. 18° 7'E. Öjlemyrflint erratic boulder (no. G8), Upper Ordovician.

Derivation of name: In honour of Prof. Dr. Nicolas Grekoff, Boulogne, France.

Figured specimens: Geologisch - Paläontologisches Institut, University of Hamburg, nos. 1926 (♀ LV: Pl. 4, 26, figs. 1 - 3), 1927 (juv. LV: Pl. 4, 28, fig. 1), 1928 (♂ RV: Pl. 4, 28, figs. 2, 3).

All from Öjlemyrflint erratic boulder no. G8 (for further data see type locality); coll. by Horst Kaufmann, 1975.

Explanation of Plate 4, 26

Figs. 1 - 3, ♀ LV (holotype, SGPIH 1926, 0.91 mm long): fig. 1, ext. lat.; fig. 2 ext. vent. obl.; fig. 3, ext. ant. obl.
Scale A (250 µm; x 80), fig. 1; scale B (250 µm; x 68), fig. 2; scale C (250 µm; x 87), fig. 3.

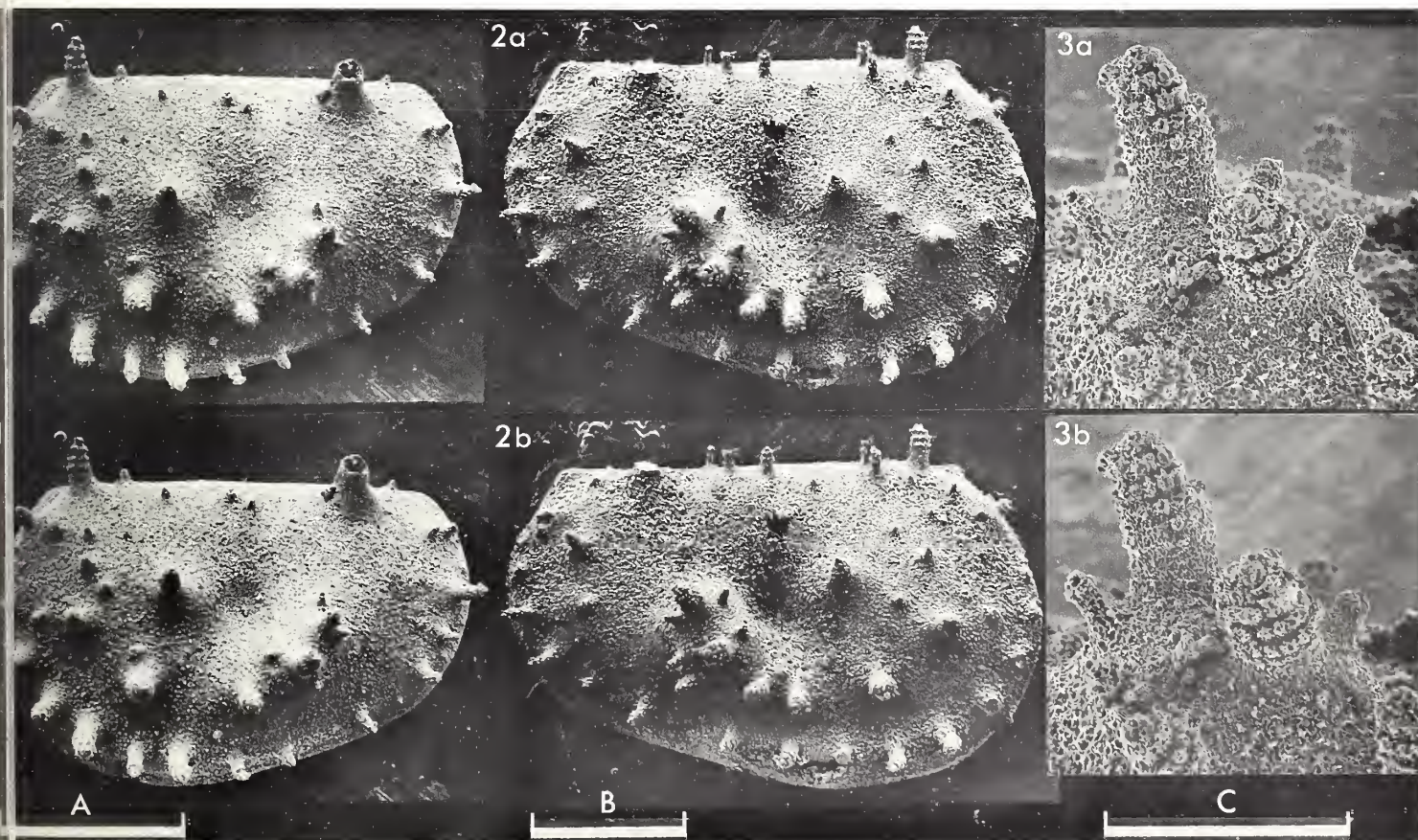
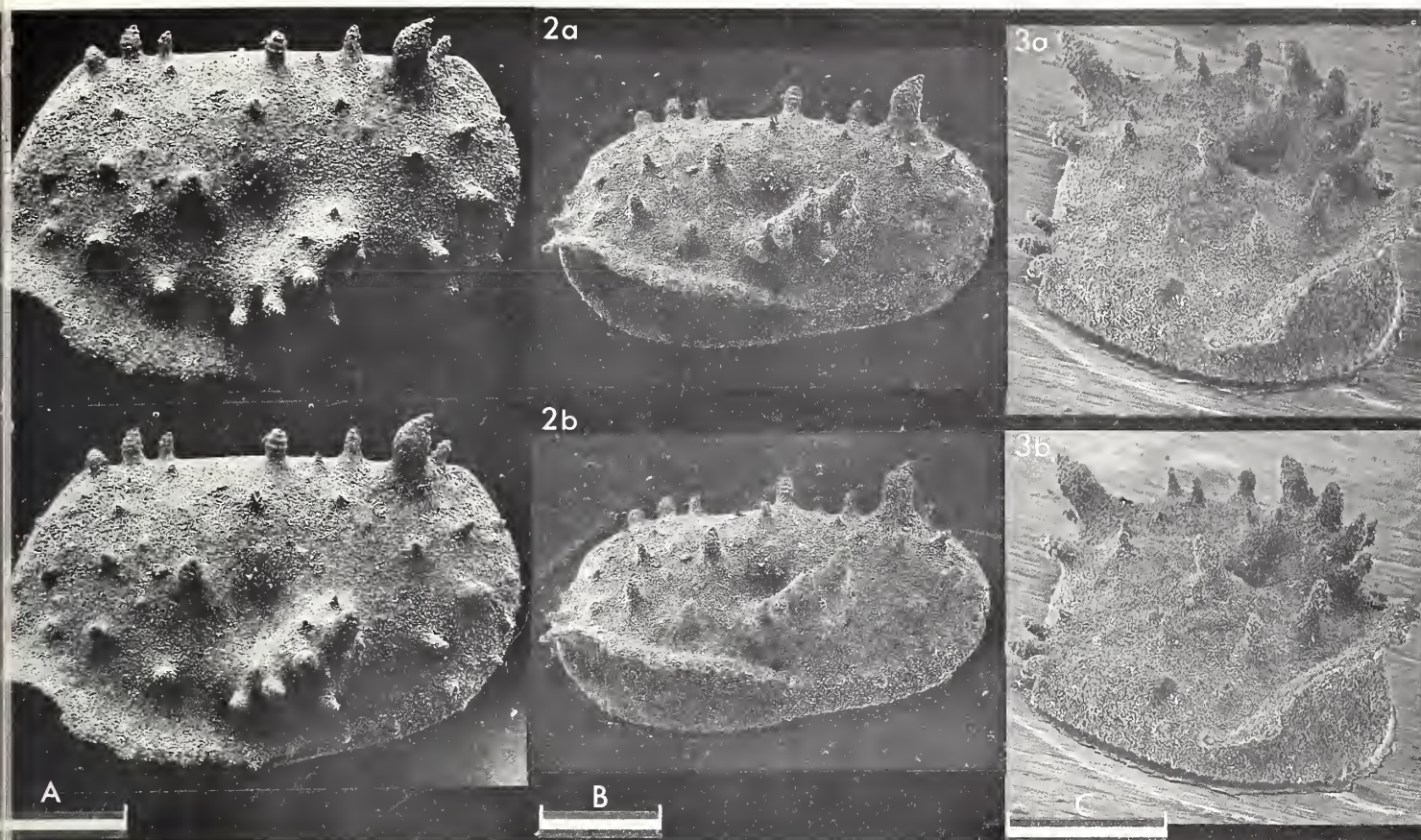
Diagnosis: Adult ♀ c. 0.91 mm in length. Preadductor node weak, diminutive, mounted by a spine which is approximately equal in size to the other spines of the lateral surface. Velum in males and larvae represented as a row of spines. Dolon faintly convex; antrum botulate (= non-loculate), extends posteriorly to the region below the posterior margin of S2 and the anteroventral half of the posteroventral lobule.

Remarks: This species is distinguished from the other known species of the genus, *D. tuberculata* (Henningsmoen) (*Norsk geol. Tidsskr.* 33, 78, 1954), *D. nabalaensis* Sarv (*Eesti NSV Tead. Akad. Geol. Inst. uurinused* 4, 150, 1959), *D. pinna* Schallreuter (*Palaeontographica*, ser. A, 149, 182, 1975), and *D. bispinata* Schallreuter (*Stereo-Atlas of Ostracod Shells* 4, 17 - 24, 1977) by its botulate (= non-loculate) antrum and/or its faintly convex dolon and its velar morphology, developed as a row of spines in the males. *D. grekoffi* therefore represents a special branch of evolution within the genus and could possibly belong to a distinct subgenus.

Distribution: Known only from the type locality.

Explanation of Plate 4, 28

Fig. 1, juv. LV, ext. lat. (SGPIH 1927, 0.58 mm long); figs. 2, 3, ♂ RV (SGPIH 1928, 0.85 mm long): fig. 2, ext. lat.; fig. 3, ext. vent. obl., spines on posteroventral lobule.
Scale A (250 µm; x 111), fig. 1; scale B (250 µm; x 86), fig. 2; scale C (10 µm; x 350), fig. 3.



ON *ANTIAECHMINA PSEUDOVELATA* SCHALLREUTER sp. nov.

by Roger E.L. Schallreuter
(University of Hamburg, German Federal Republic)

Antiaechmina pseudovelata sp. nov.

Holotype: Geologisch-Paläontologisches Institut, University of Hamburg, no. 1929, RV.

Type locality: Beach at Häftings, Isle of Gotland (Baltic Sea); lat. 57° 53'N, long. 18° 37'E. Öjlemyrflint erratic boulder (no. G13), Upper Ordovician.

Derivation of name: Referring to the 'pseudovelum'.

Figured specimens: Geologisch-Paläontologisches Institut, University of Hamburg, no. 1929 (RV: Pl. 4, 30, figs. 1 - 3; Pl. 4, 32, figs. 1, 2). From Öjlemyrflint erratic boulder no. G13 (for further data see type locality); coll. by Horst Kaufmann, 1975.

Explanation of Plate 4, 30

Figs. 1 - 3, RV (holotype, SGPIH 1929, 0.75mm long): fig. 1, ext. lat.; fig. 2, ext. anterodors. obl.; fig. 3, ext. vent.
Scale A (250 μ m; x 107), fig. 1; scale B (250 μ m; x 98), fig. 2; scale C (100 μ m; x 138), fig. 3.

Diagnosis: Valve length 0.75mm. Length: height ratio c. 1.61. Outline amplete. Cardinal corners distinct, cardinal angles much $> 90^\circ$. Anterodorsal spine occurs distinctly before mid-height and behind anterodorsal corner; base bulbous, tapers to a long, posteriorly directed spine not protruding over hinge line in lateral view. A shallow S2 skirts the posteroventral base of the spine. A ridge-like pseudovelum occurs parallel to the free margin and is entire between cardinal corners. Both the dorsum and the marginal surface are hypocline. Lateral surface reticulate.

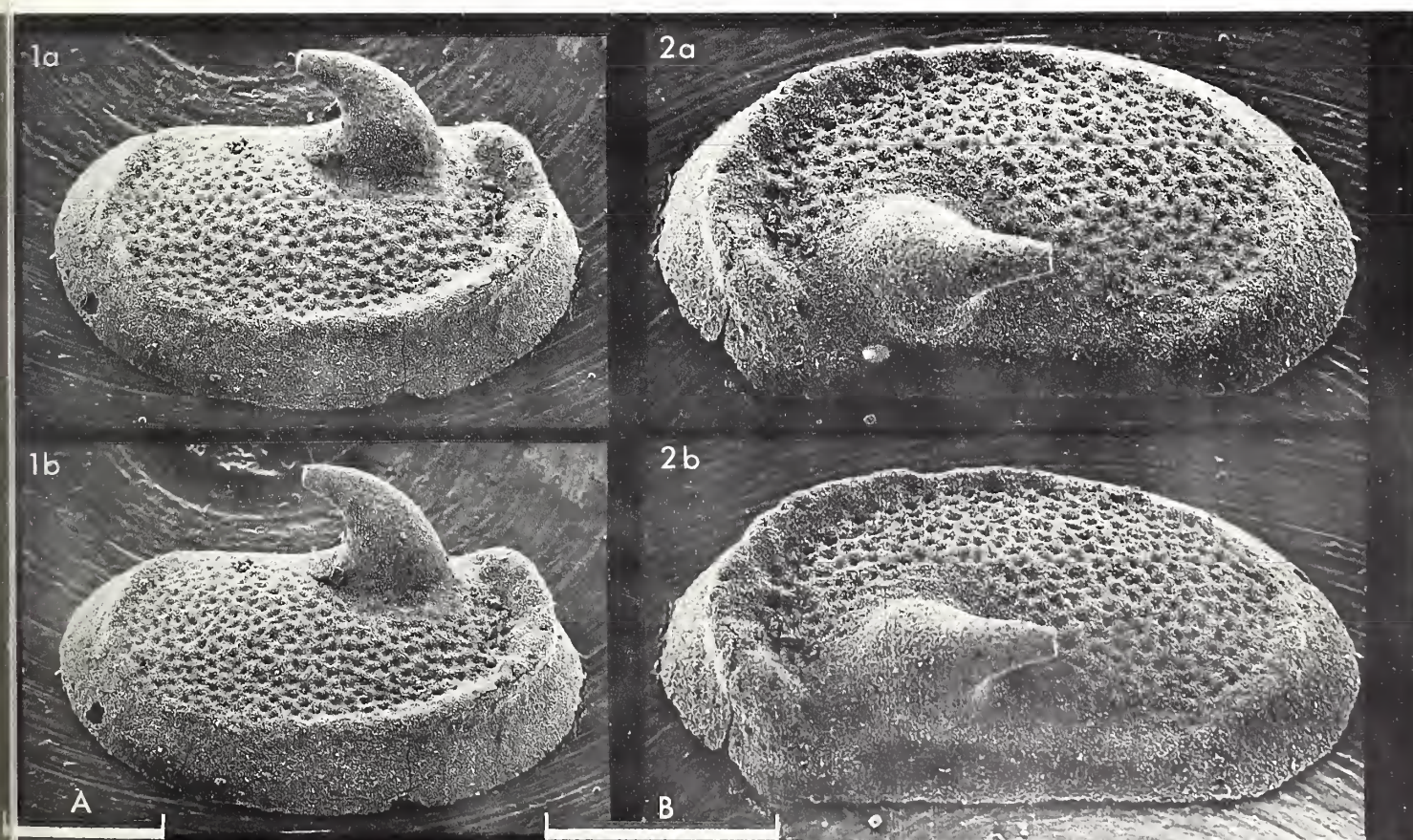
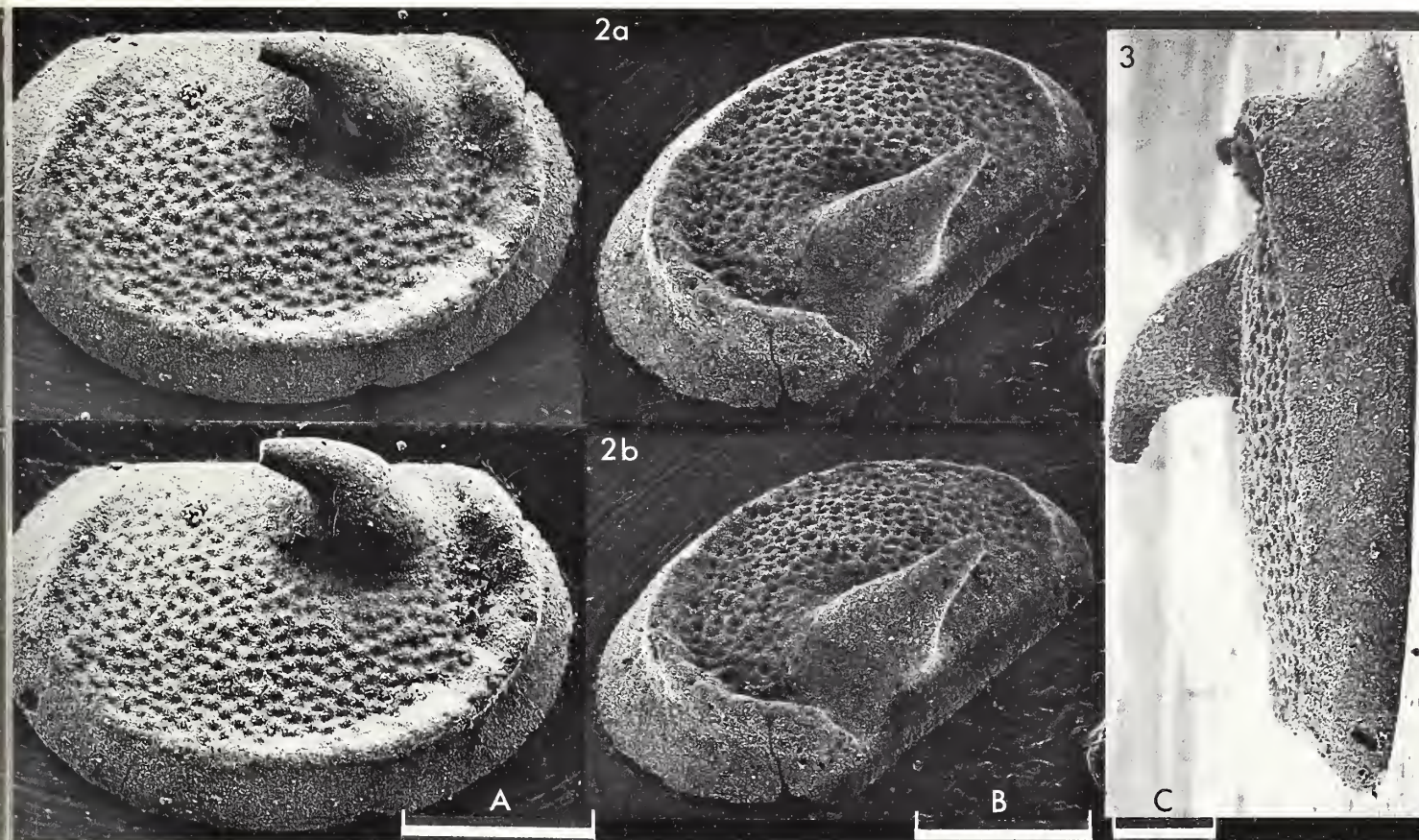
Remarks: In contrast to most other species of the genus the new species possesses a prominent pseudovelum and a reticulate lateral surface. Only *Antiaechmina anterobulbosa* (Blumenstengel) (*Freiberger ForschHft.*, ser. C. 182, 65, 1965) and *Antiaechmina ? taurea* (Keenan) (*J. Paleont.* 25, 573, 1951) exhibit a similar weak ridge parallel to the free margin. In the latter species, the systematic position of which is equivocal, the ridge forms the base for a row of small spines.

Differentiation at generic level within the Circulinidae and Aechminidae is still a little obscure. The taxonomic importance of variation exhibited by the spine, pseudovelum and reticulation is difficult to assess. Thus, some *Kinnekullea* species, for example, *K. thorslundi* Henningsmoen (*Bull. geol. Inst. Univ. Upsala* 32, 414, 1948) and *K. henningsmoeni* Neckaja (*Trudy vses neft. nauchno-issled. geol. -razv. Inst.* 251, 20, 1966), also resemble *A. pseudovelata*, but in these species the spine is confluent with the pseudovelum.

Distribution: Known only from the type locality.

Explanation of Plate 4, 32

Figs. 1, 2, RV (holotype, SGPIH 1929): fig. 1, ext. vent. obl.; fig. 2, ext. dors. obl.
Scale A (250 μ m; x 96), fig. 1; scale B (250 μ m; x 128), fig. 2.



ON *GLYPTOCYTHERE PENNI* BATE & MAYES sp. nov.

by R.H. Bate and Carol Mayes
(British Museum [Natural History], London)

Glyptocythere penni sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) OS 7582, ♀ RV. [Paratypes: Brit. Mus. (Nat. Hist.) OS 7583 – 7591].

Type locality: Middle Jurassic (Upper Bathonian, Fimbriata - Waltoni Clay: *Oppelia aspidoides* Zone of authors but dated here as *Clydomceras discus* Zone) from Old Cement Quarry, Kirtlington, Oxfordshire, England; Grid Ref. SP 49451985.

Derivation of name: After Dr. Ian E. Penn, Institute of Geological Sciences, London, for his work on British Bathonian stratigraphy.

Diagnosis: Species of *Glyptocythere* having coarsely rugose and reticulate ornamentation, two median swellings and pinched-out ventrolateral border.

Explanation of Plate 4, 34

Fig. 1, ♀ LV, ext. lat. (OS 7583, 900 μ m long); fig. 2, ♀ LV, ext. lat. (OS 7585, 930 μ m long); fig. 3, ♀ RV, ext. lat. (holotype, OS 7582, 880 μ m long).

Scale A (250 μ m; x 67), fig. 1; scale B (250 μ m; x 65), fig. 2; scale C (250 μ m; x 68), fig. 3.

Figured specimens: Brit. Mus. (Nat. Hist.) OS 7582 (♀ RV: Pl. 4, 34, fig. 3), OS 7583 (♀ LV: Pl. 4, 34, fig. 1), OS 7584 (♂ car.: Pl. 4, 36, fig. 1; Pl. 4, 40, fig. 3), OS 7585 (♀ LV: Pl. 4, 34, fig. 2), OS 7586 (juv. - 1 LV: Pl. 4, 38, fig. 2), OS 7587 (♂ LV: Pl. 4, 36, figs. 2, 3), OS 7588 (juv. - 1 car.: Pl. 4, 38, fig. 3), OS 7589 (juv. - 1 car.: Pl. 4, 40, fig. 1), OS 7590 (juv. - 1 RV: Pl. 4, 38, fig. 1), OS 7591 (♂ car.: Pl. 4, 40, fig. 2).

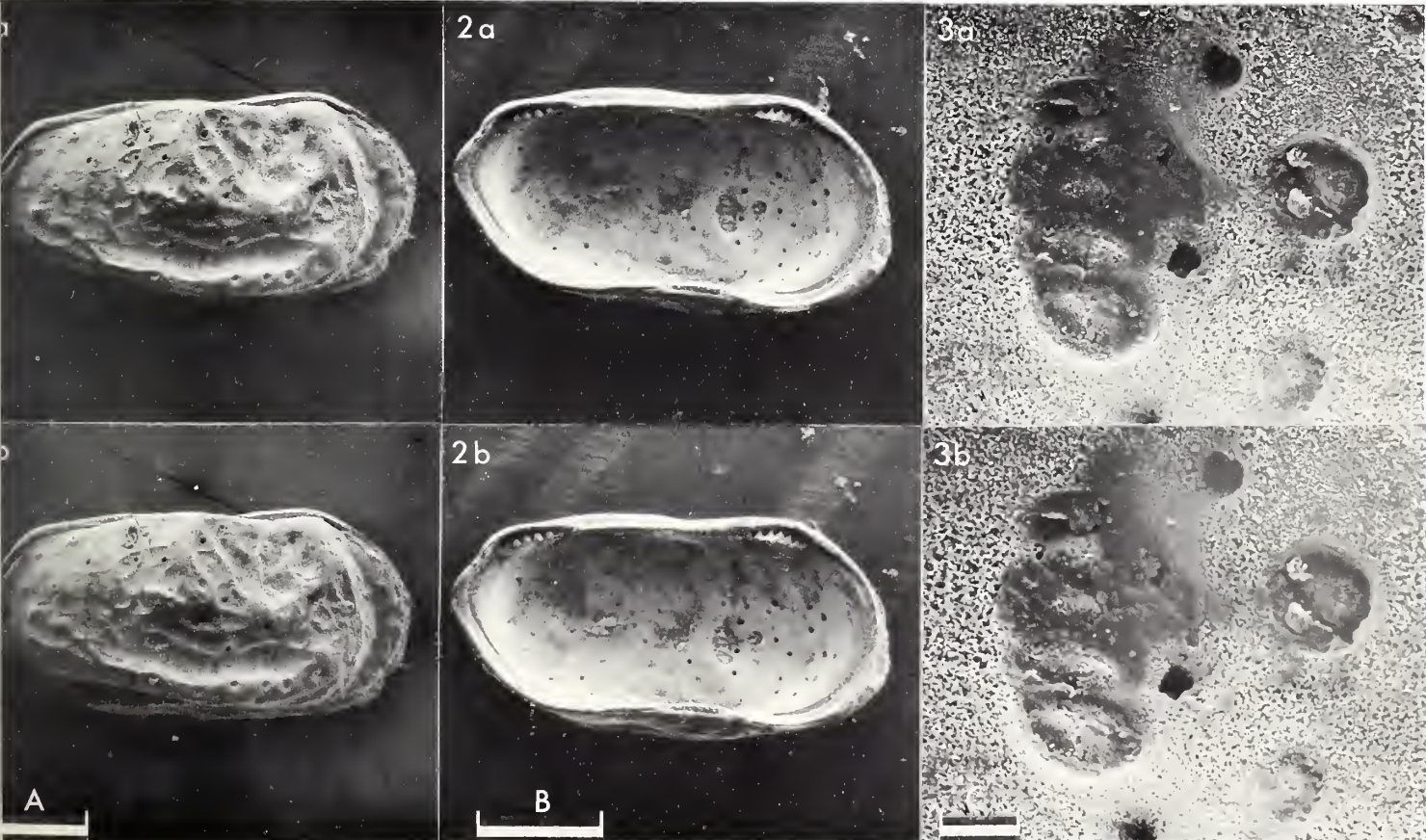
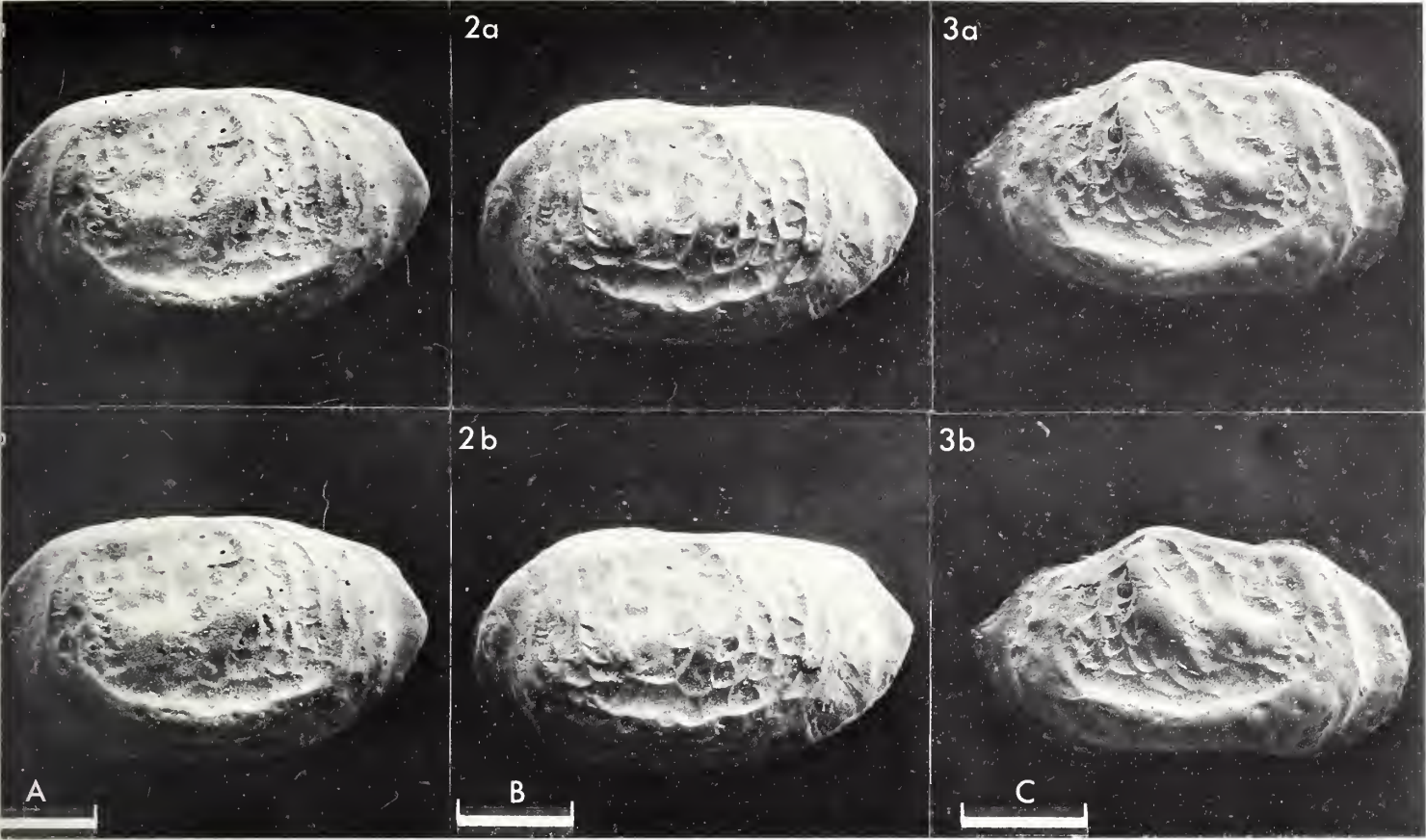
All specimens collected from the Fimbriata - Waltoni Clay at the base of the Forest Marble, Old Cement Quarry, Kirtlington, Oxfordshire.

Remarks: The Middle Bathonian *Glyptocythere oscillum* (Jones & Sherborn, 1888), like *Glyptocythere penni* sp. nov. possesses two median swellings and a pinched-out ventrolateral border. The two species are, however, readily distinguishable by the coarse reticulation and rather rugose appearance of *G. penni*. Indeed, the surface ornamentation of *G. penni* sets this species apart from all others so far described, although it shares with them the entomodont hinge, muscle scar pattern (pl. 4, 36, fig. 3), sieve plate normal pores and simple, straight marginal pore canals (*G. penni* has 7 - 8 anterior canals and 2 - 3 posterior canals; Text-fig. 1) of the genus.

Explanation of Plate 4, 36

Fig. 1, ♂ car., ext. rt. lat. (OS 7584, 1030 μ m long); figs. 2, 3, ♂ LV, int. lat. & int. musc. sc. (OS 7587, 900 μ m long).

Scale A (250 μ m; x 58), fig. 1; scale B (250 μ m; x 67), fig. 2; scale C (25 μ m; x 450), fig. 3.



Remarks:
(contd.)

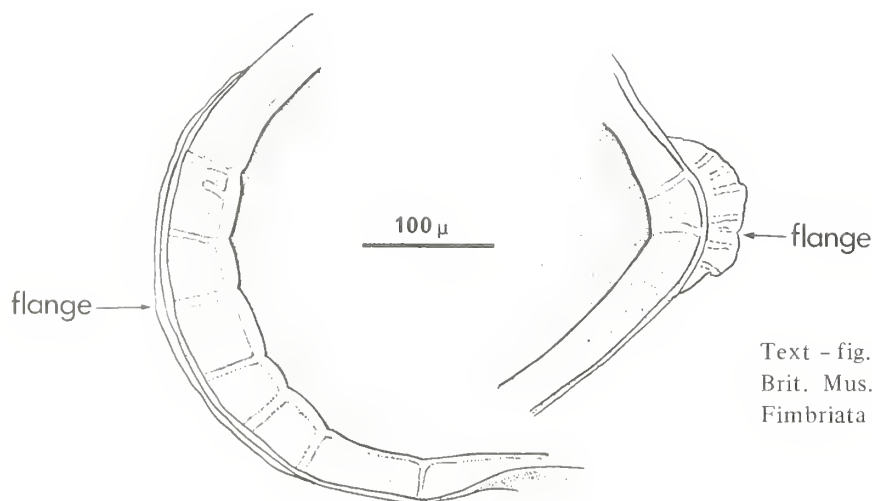
Dimensions (mm)	length	height	width
♀ RV, OS 7582	0.88	0.51	
♀ LV, OS 7583	0.90	0.55	
♂ car., OS 7584	1.03	0.49	0.44
♀ LV, OS 7585	0.93	0.56	
juv. - 1 LV, OS 7586	0.76	0.46	
♂ LV, OS 7587	0.90	0.47	
juv. - 1 car., OS 7588	0.76	0.44	0.37
juv. - 1 car., OS 7589	0.77	0.45	0.38
juv. - 1 RV, OS 7590	0.72	0.42	
♂ car., OS 7591	0.94	0.48	0.40

Distribution: The many short-ranging species of *Glyptocythere* present in the Bajocian and Bathonian of Britain and Europe (see Brand & Malz, *Senckenberg. leth.* 47, 481 - 535, 1966, and Bate in: *A Stratigraphical Index of British Ostracoda* [in press], Seel House Press) make this a stratigraphically important genus. *Glyptocythere penni*, used by Bate (op. cit.) as the index ostracod for the uppermost Bathonian ostracod zone, is restricted to beds of known *Clydoniceras discus* Zone age; it has not been found in sediments dated as belonging to the *Oppelia aspidoides* Zone. Because of this the Fimbriata - Waltoni Clay of Kirtlington is dated as being of *C. discus* Zone age with the beds between this and the White Limestone beneath having been removed prior to the deposition of the Fimbriata - Waltoni Clay.

Explanation of Plate 4, 38

Fig. 1, juv. - 1, int. rt. lat. (OS 7590, 720 μ m long); fig. 2, juv. - 1, int. lt. lat. (OS 7586, 760 μ m long); fig. 3, juv. - 1 car., vent. (OS 7588, 760 μ m long).

Scale A (250 μ m; x 83), fig. 1; scale B (250 μ m; x 80), figs. 2, 3.

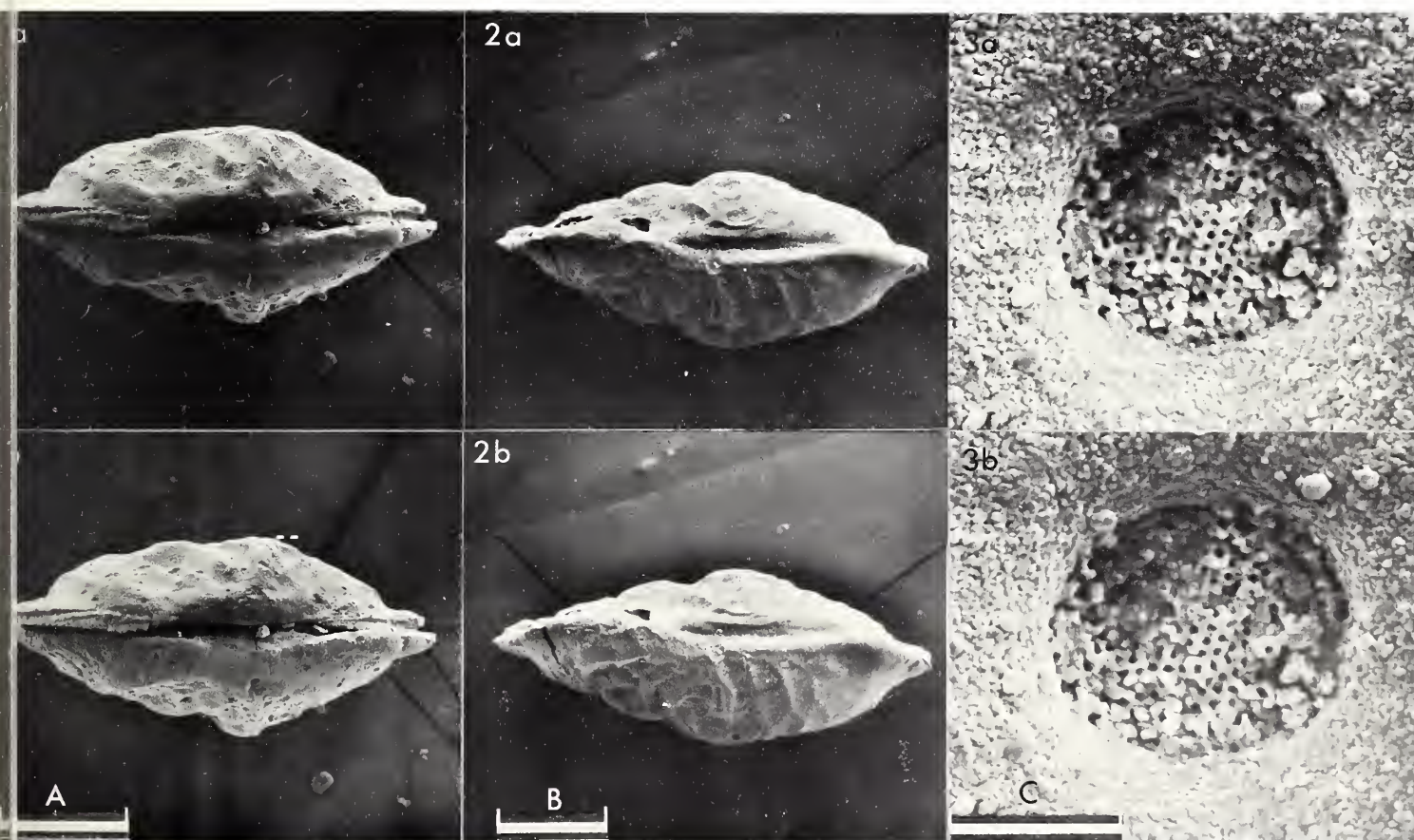
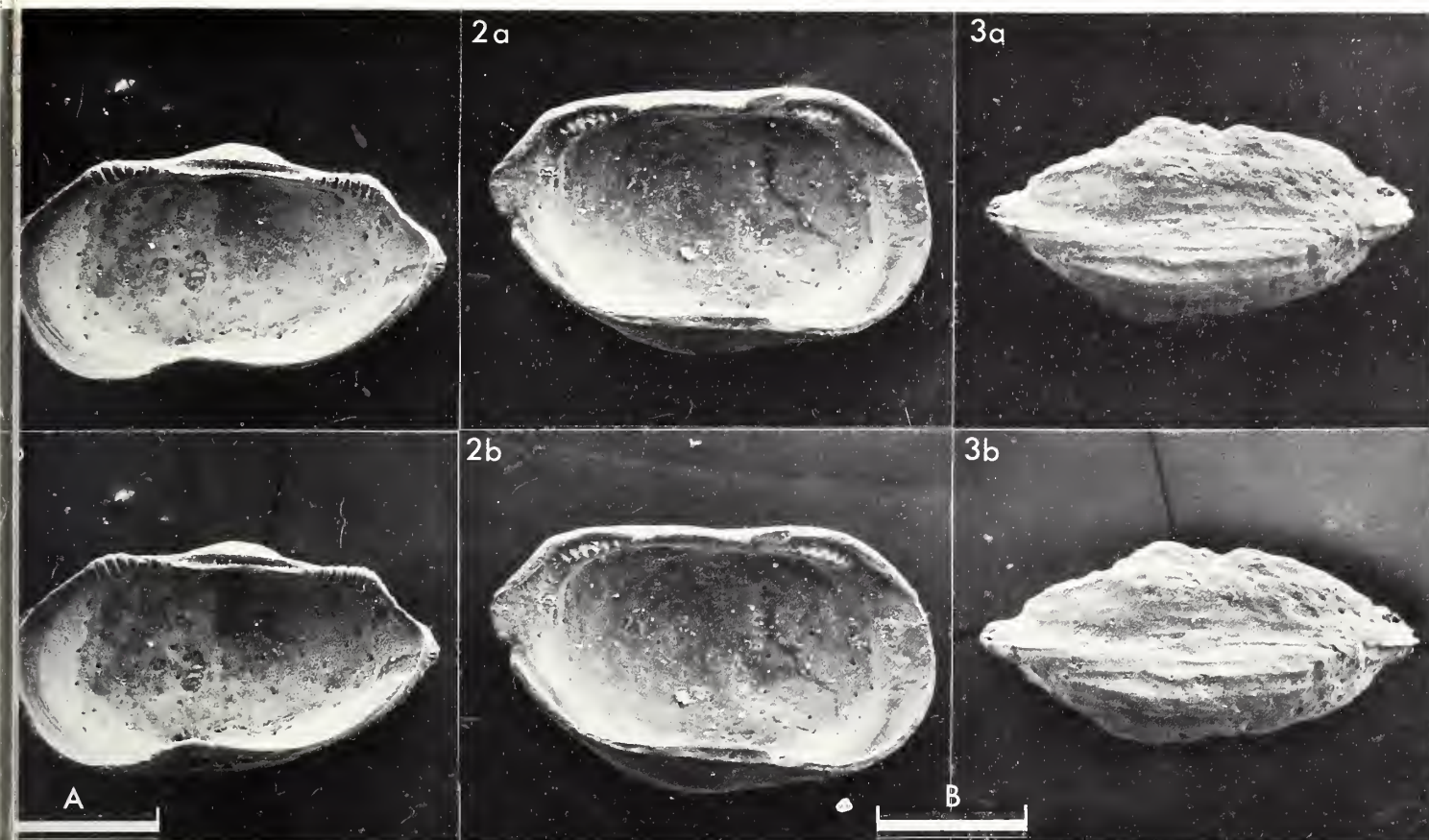


Text - fig. 1. Ant. & post. marginal pore canals in *G. penni*. Brit. Mus. [Nat. Hist.] IO 5503, ♀ RV, length 0.80mm; Fimbriata - Waltoni Clay, Kirtlington.

Explanation of Plate 4, 40

Fig. 1, juv. - 1 car., dors. (OS 7589, 770 μ m long); fig. 2, ♂ car., dors. (OS 7591, 940 μ m long); fig. 3, ♂ car., normal pore with sieve plate (OS 7584).

Scale A (250 μ m; x 78), fig. 1; scale B (250 μ m; x 64), fig. 2; scale C (10 μ m; x 2,400), fig. 3.



ON *PARACYTHERIDEA ANAPETES* AHMAD sp. nov.

by Manzoor Ahmad
(University of Hull, England)

Paracytheridea anapetes sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) no. **OS 7757**, ♀ car. [Paratypes: Brit. Mus. (Nat. Hist.) nos. **OS 7758**, **OS 7760**]

Type locality: E Shore, Lindi Creek, Tanzania; from sample FCRM 2034 at lat. 10° 3.4'S, long. 39° 42.03'E. Upper Eocene.

Derivation of name: Greek *anapetes*, expanded. A reference to the posterodorsal swelling and ventral ala.

Figured specimens: Brit. Mus. (Nat. Hist.) coll. nos. **OS 7759** (♂ LV: Pl. 4, 42, fig. 1), **OS 7757** (♀ car.: Pl. 4, 42, figs. 2, 3; Pl. 4, 44, fig. 1), **OS 7758** (♀ LV: Pl. 4, 44, fig. 2). Specimens **OS 7757**, **OS 7758** from type locality; **OS 7759** (Sample FCRM 2033) from 10m N of type locality, Upper Eocene.

Explanation of Plate 4, 42

Fig. 1, ♂ LV, ext. lat. (**OS 7759**, 625 µm long); figs. 2, 3, ♀ car. (holotype, **OS 7757**, 580 µm long): fig. 2, ext. lt. lat.; fig. 3, ext. rt. lat.
Scale A (100 µm; x 101), fig. 1; scale B (100 µm; x 107), fig. 2; scale C (100 µm; x 193), fig. 3.

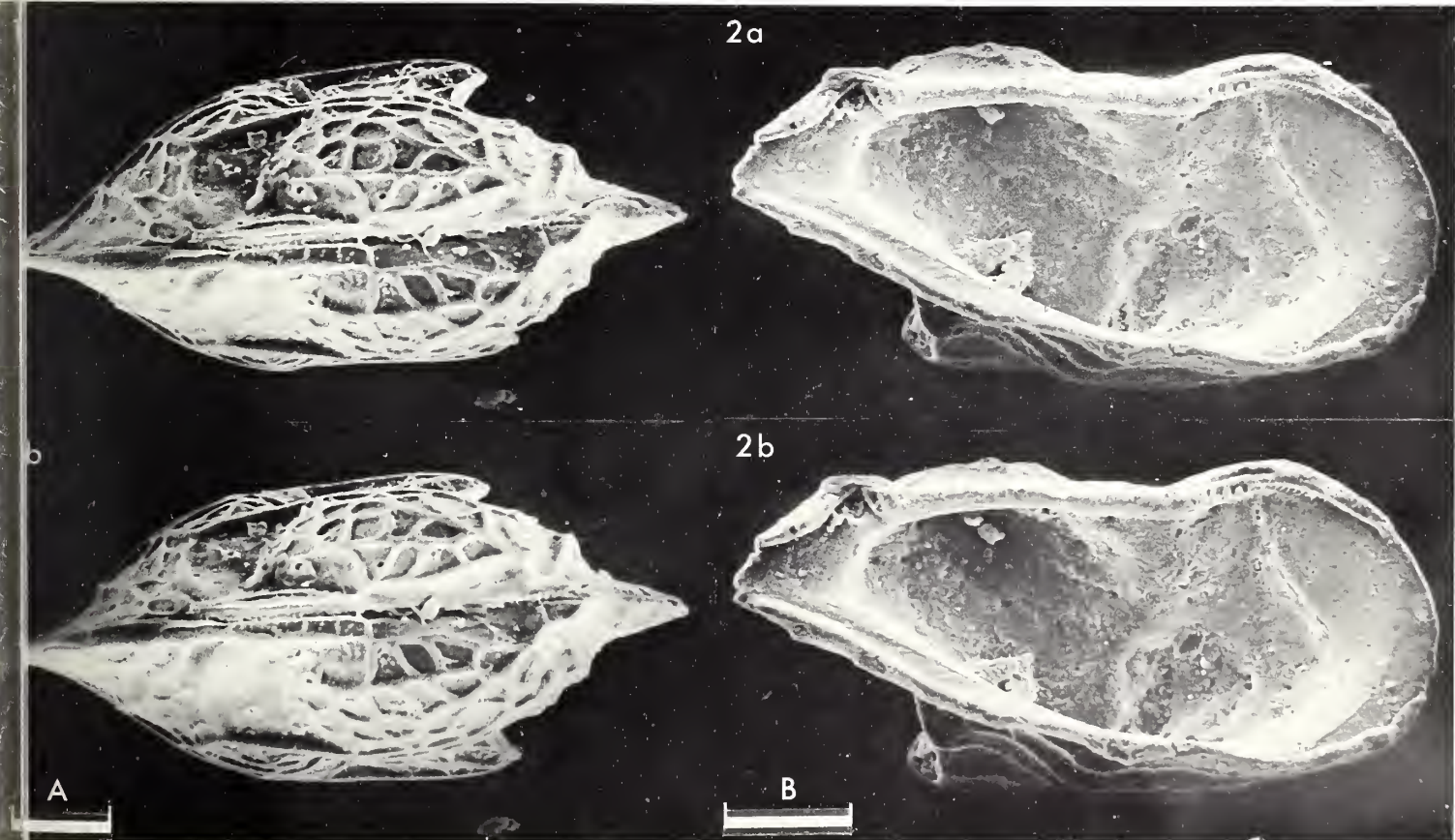
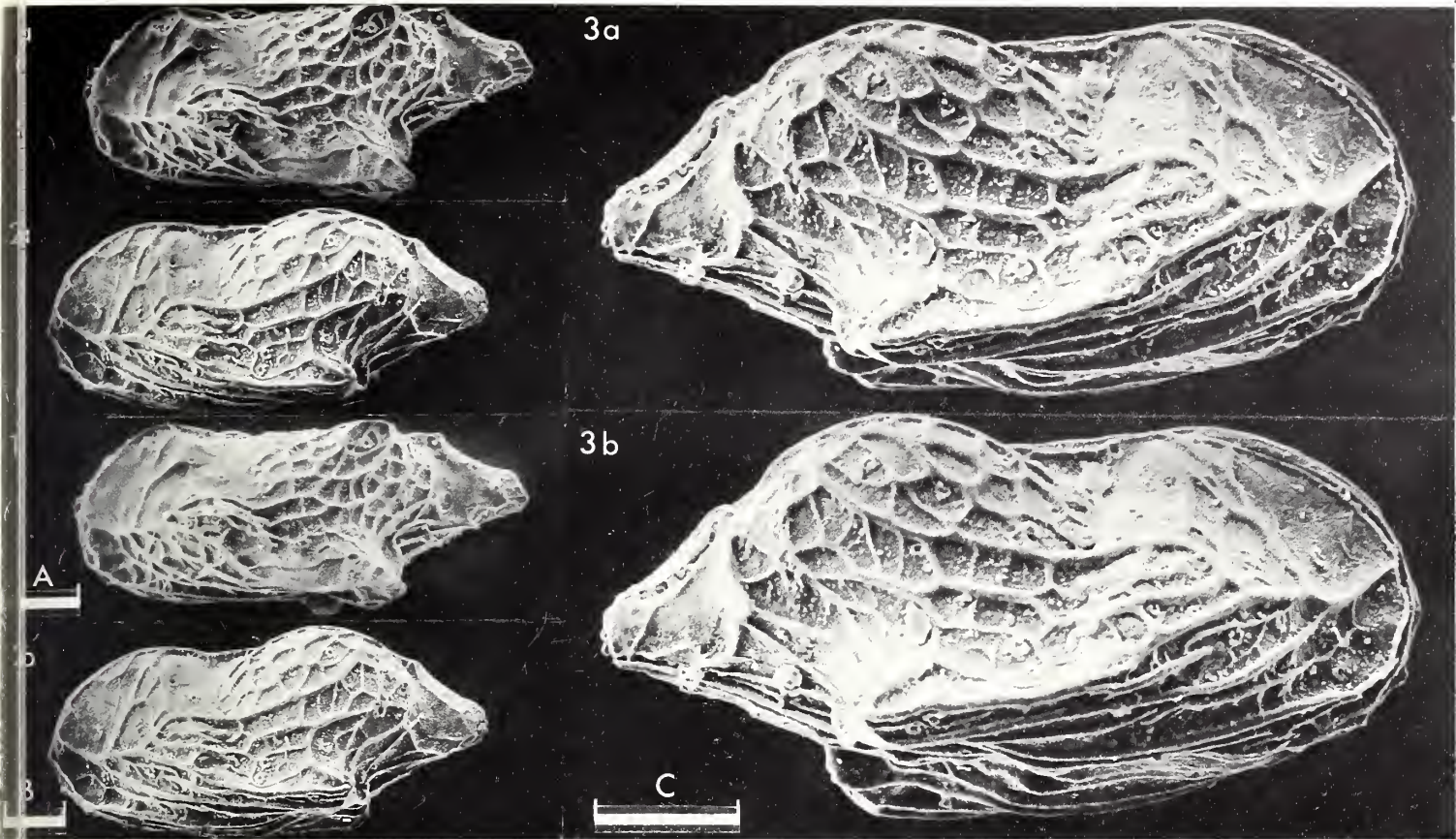
Diagnosis: A species with distinct sexual dimorphism; the presumed females are shorter compared with the presumed males and have a bulbous posterodorsal swelling which is much reduced in the males. Besides the usual hinge elements of the genus, the right valve has 14 - 15 small denticles in front of the anterior cusped dental area. The left valve has corresponding sockets.

Remarks: *Paracytheridea longicaudata chilensis* Hartmann, 1962 (*Mitt. zool. Mus. Hamb.* 60, 211, 212), a Recent form from northern Chile, resembles the new species in general shape and the coarser ornamentation but the Tanzanian species can easily be distinguished by its thin ribs criss-crossing the thicker ribs and the slightly different hinge outlined above. No other similarities have so far been found between E African and Chilean post-Mesozoic ostracods.

Distribution: So far only known from Tanzania, mostly from Auversian - Bartonian, Eocene beds, but recorded also from Lattorfian - Rupelian, Oligocene.

Explanation of Plate 4, 44

Fig. 1, ♀ car., dors. (holotype, **OS 7757**, 580 µm long); fig. 2, ♀ LV, int. lat. (**OS 7758**, 574 µm long).
Scale A (100 µm; x 160), fig. 1; scale B (100 µm; x 171), fig. 2.



ON *CLADAROCY THERE PTEROTA* AHMAD gen. et. sp. nov.

by Manzoor Ahmad
(University of Hull, England)

Genus *CLADAROCY THERE* gen. nov.
Type-species: *Cladarocythere pterota* sp. nov.

Derivation of name: From the Greek *kladaros*, fragile, and the generic name *Cythere*; with reference to the fragility of the shell. Gender, feminine.

Diagnosis: Small to medium sized, very fragile. Lateral surface almost smooth except for a prominent adventral frill, which is divided into 11 compartments by thickened normal pore canals. Muscle scar pattern consists of four small adductor scars arranged in a vertical row with three larger frontal scars placed dorsally, the ventral one of which is 'V-shaped'. Eye spot absent.

Remarks: The new genus is closely related to *Pseudocytherura* Dubowsky, 1939 (= *Paracytheropteron* Ruggieri, 1952) and *Paracytheridea* Müller, 1894, but can be distinguished by the absence of lateral ornamentation and eye tubercle, less calcification and the different development of the frill, which gives *Cladarocythere* a very different shape in dorsal view. The frill on *Manawa* Hornibrook, 1949 and *Cladarocythere* is very similar, but in all other respects the two genera are different.

Explanation of Plate 4, 46

Fig. 1, LV, ext. lat. (OS 7774, 492 μ m long); fig. 2, RV, ext. lat. (holotype, OS 7772, 496 μ m long).
Scale A (100 μ m; x 182), fig. 1; scale B (100 μ m; x 171), fig. 2.

Remarks: 'Genus Uncertain, species RC' of Maddocks 1966 (*Univ. Kans. Paleont. Contr.* 12) belongs in (contd.) *Cladarocythere*.

Maddocks (1966, p.67) reported subfossil specimens from carbonate and quartz carbonate sands, muddy sands and clays in depths of 2 - 24m from the Nosy Bé area of N Madagascar. The Tanzanian specimens occur in shallow water, carbonate muddy sands.

Cladarocythere pterota sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) coll. no. OS 7772, RV. [Paratypes: Ten single valves, Brit. Mus. (Nat. Hist.) coll. nos. OS 7773 - OS 7782].

Type locality: Stream SW of Mtwero, Lindi, Tanzania; from sample no. FCRM 2010, approx. lat. 9° 56'S, long. 39° 43'E. Lower Miocene.

Derivation of name: From the Greek *pteros*, winged; with reference to the wing-like frill.

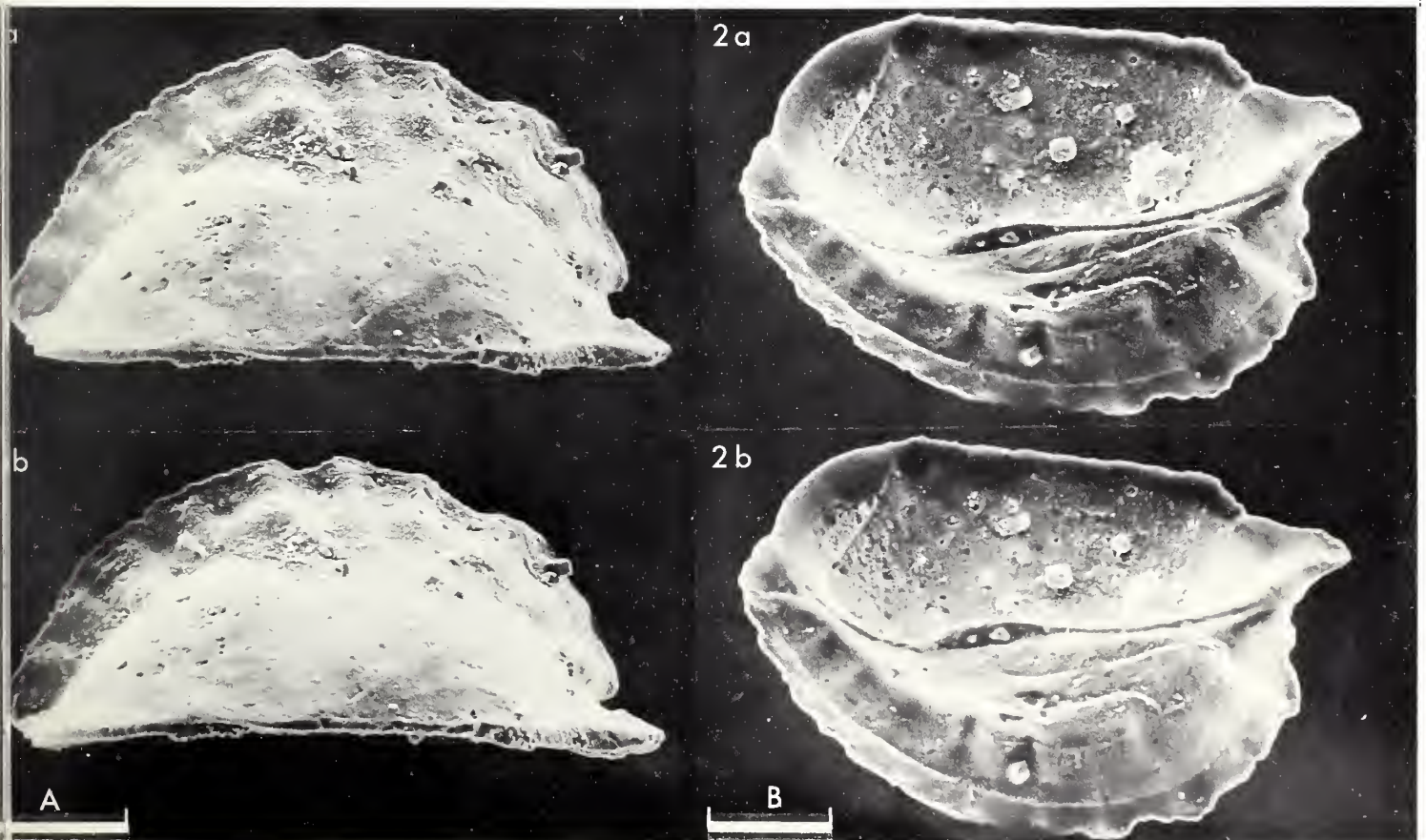
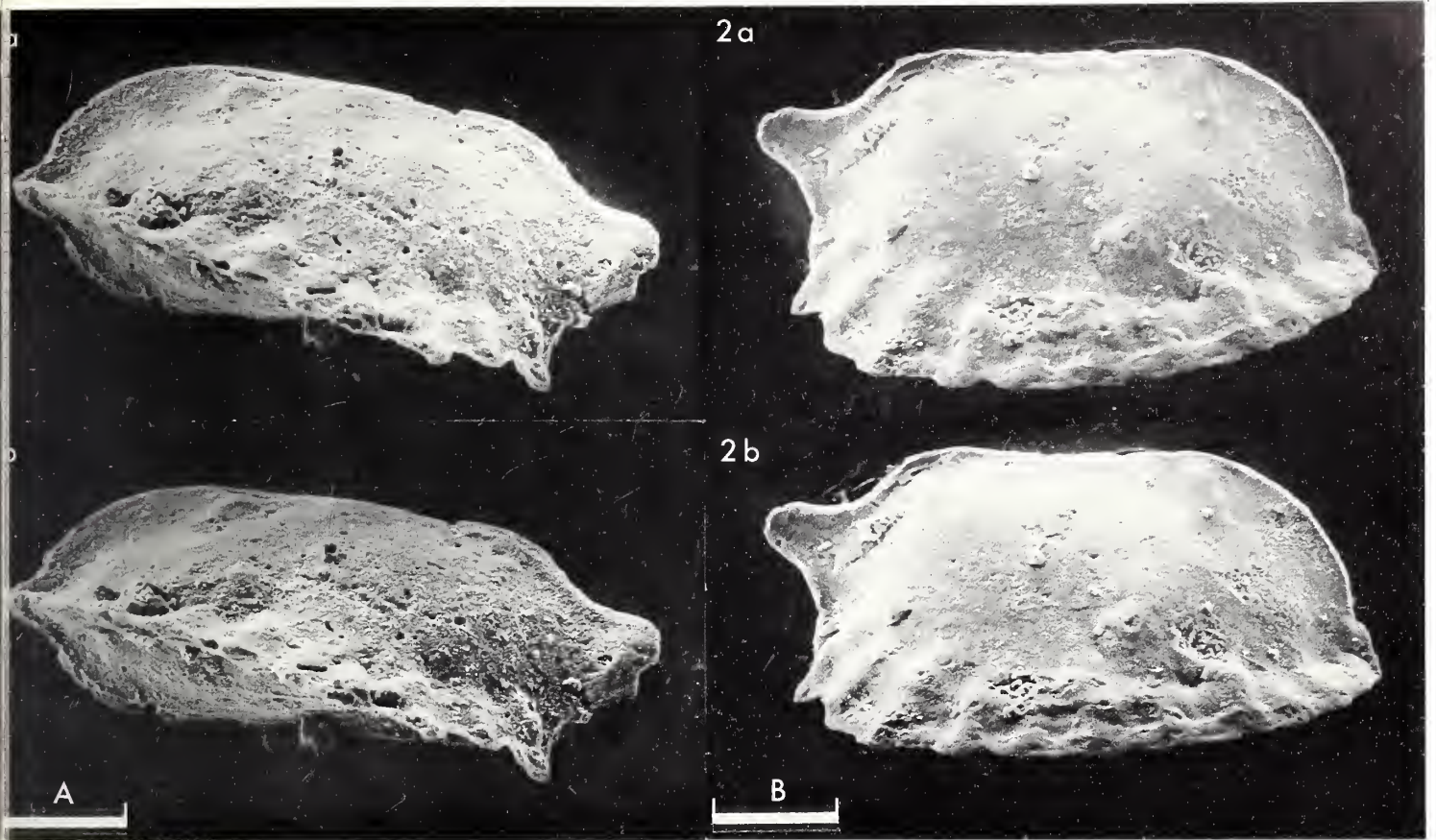
Figured specimens: Brit. Mus. (Nat. Hist.) coll. nos. OS 7774 (LV: Pl. 4, 46, fig. 1), OS 7772 (RV: Pl. 4, 46, fig. 2; Pl. 4, 48, fig. 2), OS 7773 (RV: Pl. 4, 48, fig. 1). All specimens are from the type locality and horizon.

Diagnosis: As for the genus. Frill with about 11 compartments and ventral to the frill in the posterior half are two very fine ribs which run parallel to the ventral margin.

Remarks: 'Genus Uncertain, species RC' of Maddocks (1966, figs. 55.1, 55.2) is a very closely related form and may even be conspecific with *C. pterota*.

Explanation of Plate 4, 48

Fig. 1, RV, ext. dors. (OS 7773, 472 μ m long); fig. 2, RV, int. vent. obl. (holotype, OS 7772, 496 μ m long).
Scale A (100 μ m; x 199), fig. 1; scale B (100 μ m; x 171), fig. 2.



ON *GAMMACY THERE UBIQUITA* MALZ & LORD

by Alan Lord and Heinz Malz
(University College London & Forschungsinstitut Senckenberg, Frankfurt am Main)

Genus *GAMMACY THERE* Malz & Lord, 1976

Type-species (by original designation): *Gammacythere ubiquita* Malz & Lord, 1976

Diagnosis: Elliptical in lateral view with valves ventrally inflated. Smooth, flat, and protruding marginal rims are present anteriorly and posteriorly. Dorsal valve edges straight or very slightly curved and close together throughout the length of the dorsal margin. Anterior marginal pore canals widely and evenly spaced; eight canals anteriorly, four posteriorly. Hinge tripartite; terminal loculate grooves with a smooth connecting bar in the left valve. Strongly dimorphic.

Gammacythere ubiquita Malz & Lord, 1976

1938 Ostracode (513); C.A. Wicher, *Abh. preuss. geol. Landesanst.* 193, 15, pl. 27, fig. 5.

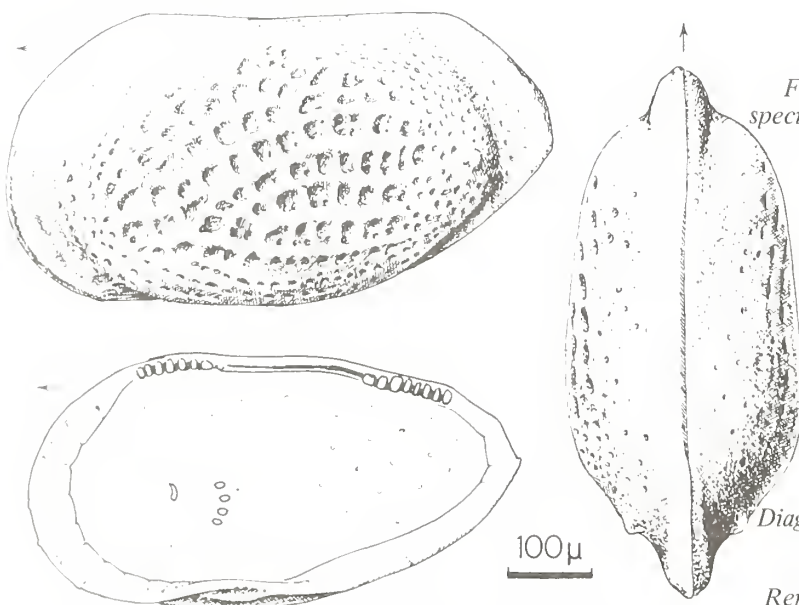
1976 *Gammacythere ubiquita* sp. nov. H. Malz & A.R. Lord, *Senckenberg leth.* 57 (4/6), 252, pls. 1, 2 (q.v. for full synonymy).

Holotype: Forschungsinstitut Senckenberg, Frankfurt, SMF Xe 10429, ♂ LV.

Type locality: Borehole Hambühren — WA 2, W Germany (MTB 3325, Winsen a.d. Aller), 630m below surface; Lower Pliensbachian (Lias ♂).

Explanation of Plate 4, 50

Fig. 1, ♂ LV, ext. lt. lat. (holotype, Xe 10429, 910 µm long); fig. 2, ♂ RV, ext. rt. lat. (Xe 10452, 770 µm long). Scale A (200 µm; x 90), fig. 1; scale B (200 µm; x 110), fig. 2.



Text - fig. 1. *Gammacythere ubiquita* Malz & Lord (♀); ibex Zone, Lower Pliensbachian, Blockley Station Quarry, Gloucestershire, England. Drawings by Dr. John C. Holden.

Figured specimens:

Forschungsinstitut Senckenberg nos. Xe 10429 (holotype, ♂ LV: Pl. 4, 50, fig. 1), Xe 10452 (♂ RV: Pl. 4, 50, fig. 2), Xe 10431 (♀ car.: Pl. 4, 52, fig. 1), Xe 10430 (♀ car.: Pl. 4, 52, fig. 2), Xe 10449 (♀ LV: Pl. 4, 52, fig. 3), Xe 10432 (♂ car.: Pl. 4, 52, fig. 4) and Xe 10431 (♂ car.: Pl. 4, 52, fig. 5). Specimens Xe 10429 — Xe 10432 from Hambühren — WA 2, W Germany (Lower Pliensbachian; type locality and horizon); Xe 10449 from Borehole Schlieven 4, W Mecklenburg, E Germany (Lower Pliensbachian); Xe 10452 from Stowell Park Borehole, Gloucestershire, England (1090 - 1100 ft below surface, Lower Pliensbachian), Grid ref. SP 084118.

Diagnosis:

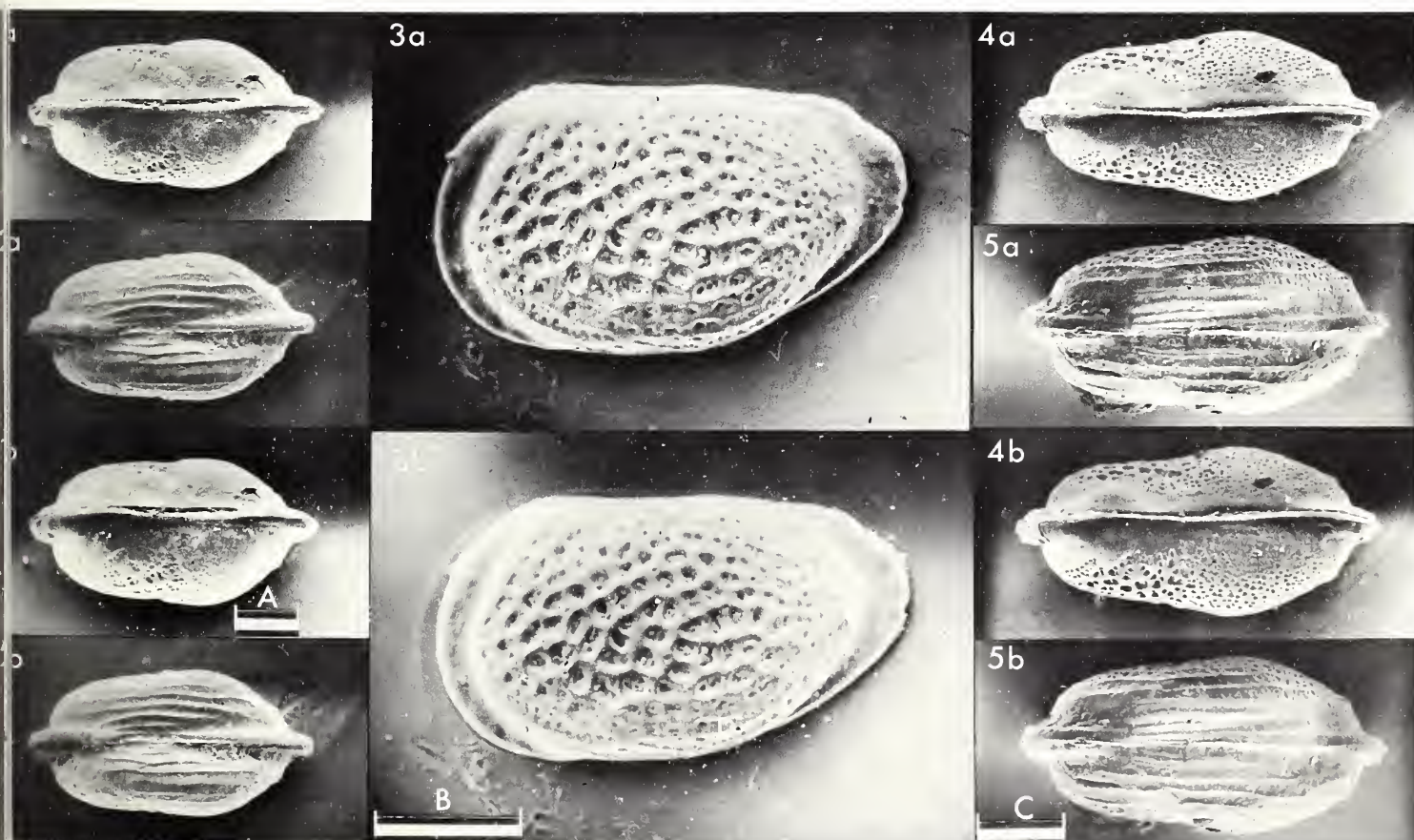
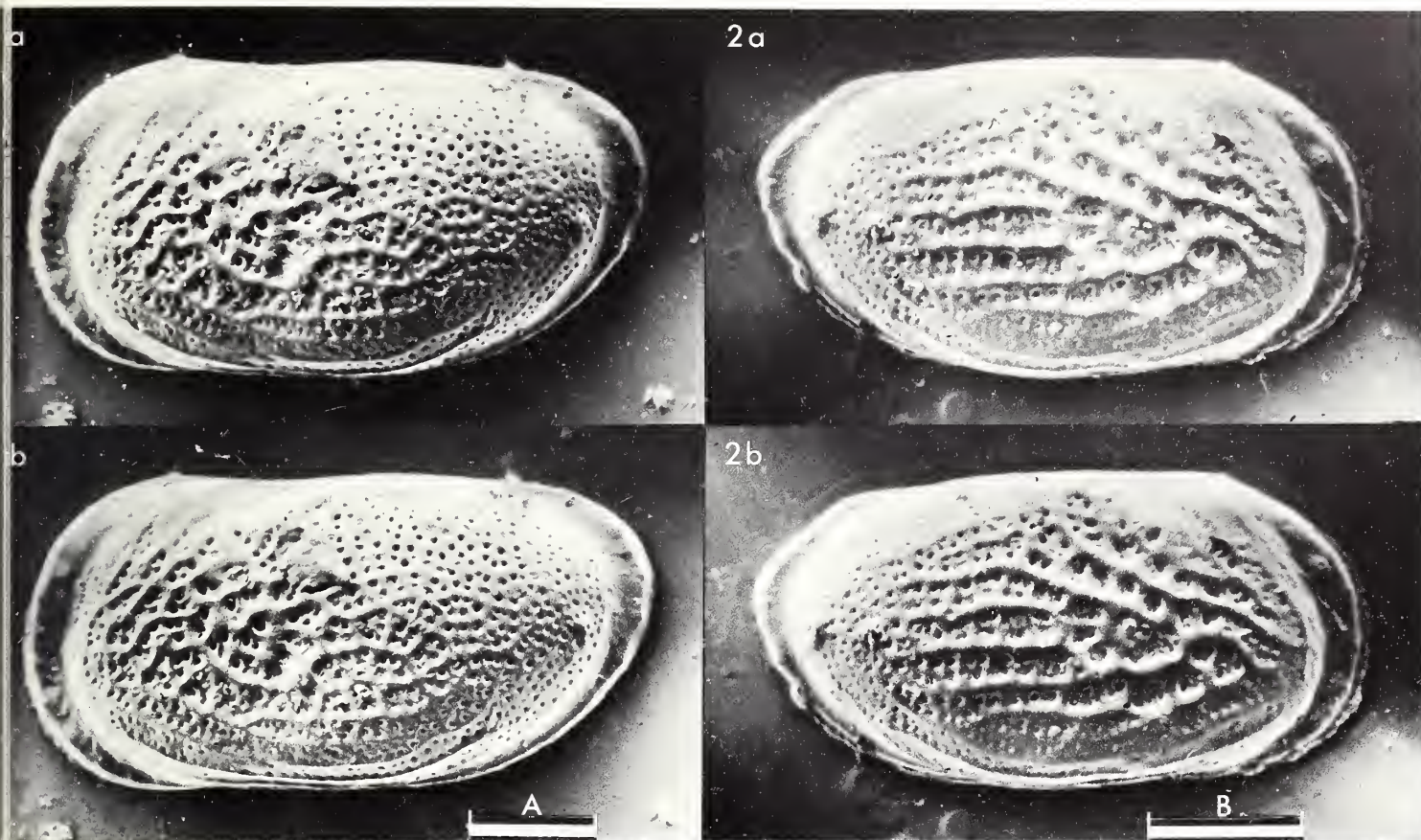
As for the genus (*Gammacythere* is at present monospecific).

Remarks:

A distinctive and widespread early Pliensbachian species in NW Europe. Highly variable in size and ornament. Discussed in detail by Malz & Lord (1976).

Explanation of Plate 4, 52

Fig. 1, ♀ car., ext. dors. (Xe 10431, 800 µm long), fig. 2, ♀ car., ext. vent. (Xe 10430, 810 µm long); fig. 3, ♀ LV, ext. lt. lat. (Xe 10449, 680 µm long); fig. 4, ♂ car., ext. dors. (Xe 10432, 930 µm long); fig. 5, ♂ car., ext. vent. (Xe 10431, 910 µm long). Scale A (200 µm; x 50), figs. 1, 2, 4; scale B (200 µm; x 100), fig. 3; scale C (200 µm; x 60), fig. 5.



ON *CALLISTOCY THERE BADIA* (NORMAN)

by John Athersuch and John E. Whittaker
(University of Leicester and British Museum [Nat. Hist.], London)

Callistocythere badia (Norman, 1862)

1862 *Cythere badia* sp. nov. A.M. Norman, *Ann. Mag. Nat. Hist.* ser. 3, 9, 48, pl. 3, figs. 13 - 15.

Lectotype: (here designated) ♀ carapace, housed with the Brady coll., Hancock Museum. Newcastle-upon-Tyne; no catalogue no., but placed in a separate, labelled slide.

Type locality: Mount's Bay, Penzance, Cornwall, SW England, approx. lat. 50° 04'N, long. 05° 30'W; Recent.

Diagnosis: Ornament very subdued for genus; pattern distinctive; fossae best developed at anterior and posterior margins.

Figured specimens: Hancock Museum specimen: lectotype (♀ car.: Pl. 4, 54, fig. 1), collected alive by the Rev. A.M. Norman, May, 1855, from marine algae in rock-pools.

Explanation of Plate 4, 54

Fig. 1, ♀ car., ext. lt. lat. (lectotype, 520 µm long); fig. 2, ♀ car., ext. lt. lat. (1976.1304, 520 µm long); fig. 3., ♀ car., ext. lt. lat. (1976.1305, 510 µm long); fig. 4, juv. - 1 car., ext. lt. lat. (1976.1306, 450 µm long); fig. 5, ♂ car., ext. lt. lat. (1976.1307, 500 µm long); fig. 6, ♂ car., ext. rt. lat. (1976.1308, 510 µm long); fig. 7, ♀ LV, int. lat. (1976.1309, 500 µm long), fig. 8, ♂ LV, int. lat. showing soft parts (1976.1310, 505 µm long).
Scale A (125 µm; x 95), figs. 1 - 8.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. 1976.1304 (♀ car.: Pl. 4, 54, fig. 2); 1976.1305 (♀ car.: Pl. 4, 54, fig. 3); (contd.) 1976.1306 (juv. - 1 car.: Pl. 4, 54, fig. 4); 1976.1307 (♂ car.: Pl. 4, 54, fig. 5); 1976.1308 (♂ car.: Pl. 4, 54, fig. 6; Pl. 4, 56, fig. 1); 1976.1309 (♀ LV: Pl. 4, 54, fig. 7; Pl. 4, 56, figs. 2, 3, 5, 7); 1976.1310 (♂ LV: Pl. 4, 54, fig. 8); 1976.1311 (♀ RV: Pl. 4, 56, figs. 4, 6). Text-figs. 1 - 3 are based on 1976.1312.

1976.1304, 1306 were collected alive by J.E. Whittaker on 3rd. August, 1969 from the alga *Enteromorpha intestinalis* in rock-pools at Osmington Mills, Weymouth Bay, S England, approx. lat. 50° 38'N, long. 02° 23'W; water temperature 19°C, salinity 34°/oo.

1976.1305, 1307 - 1312 were collected alive by J. Athersuch during autumn, 1973, from filamentous algae at Dhekelia, Cyprus, approx. lat. 34° 58'N, long. 33° 46'E; water temperature 24°C, depth 5 cm, salinity 39°/oo.

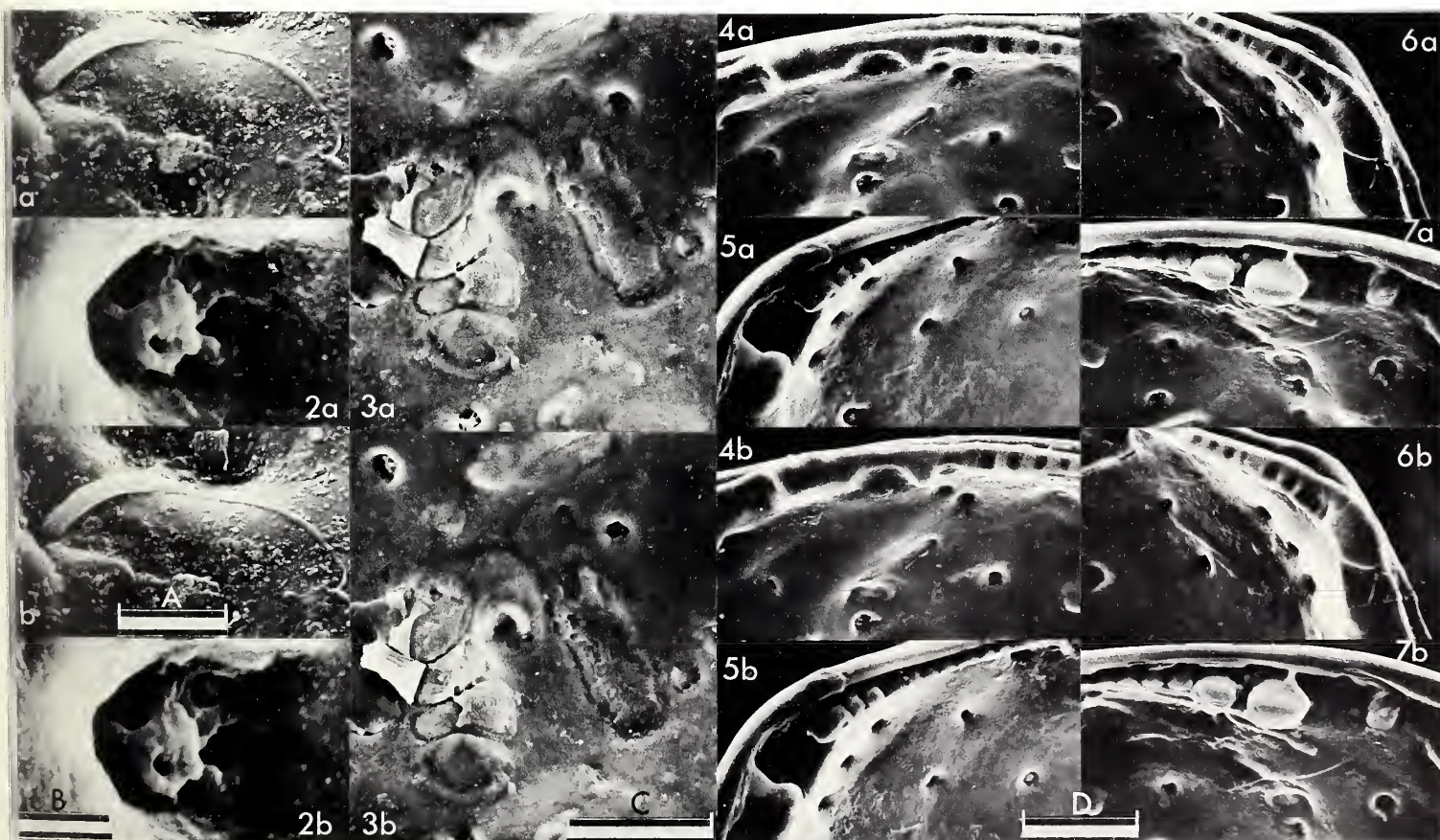
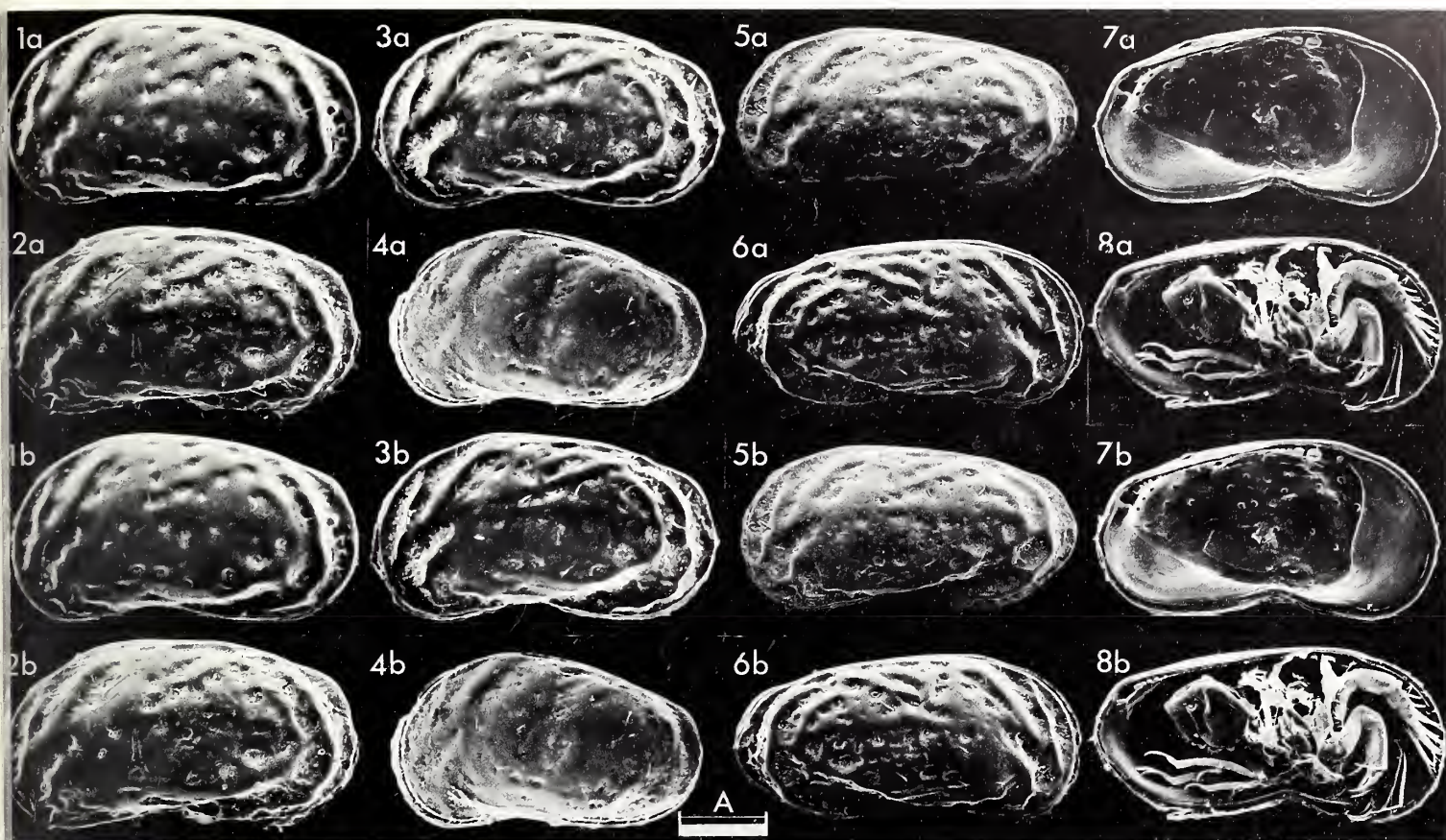
Remarks: Previous records of *C. badia* have been confined almost exclusively to the shores of the British Isles. An examination of material in the Brit. Mus. (Nat. Hist.), Hancock Museum and our own collections revealed only females and confirmed the widespread, but infrequent, occurrence of this dimorph of the species in Britain. However, one of us (J.A.) has found both dimorphs living in Cyprus. We have not been able to confirm records from other areas. This little known species may well have a wider European distribution, but probably has not been recognised due to the inadequacy of the original illustrations and description.

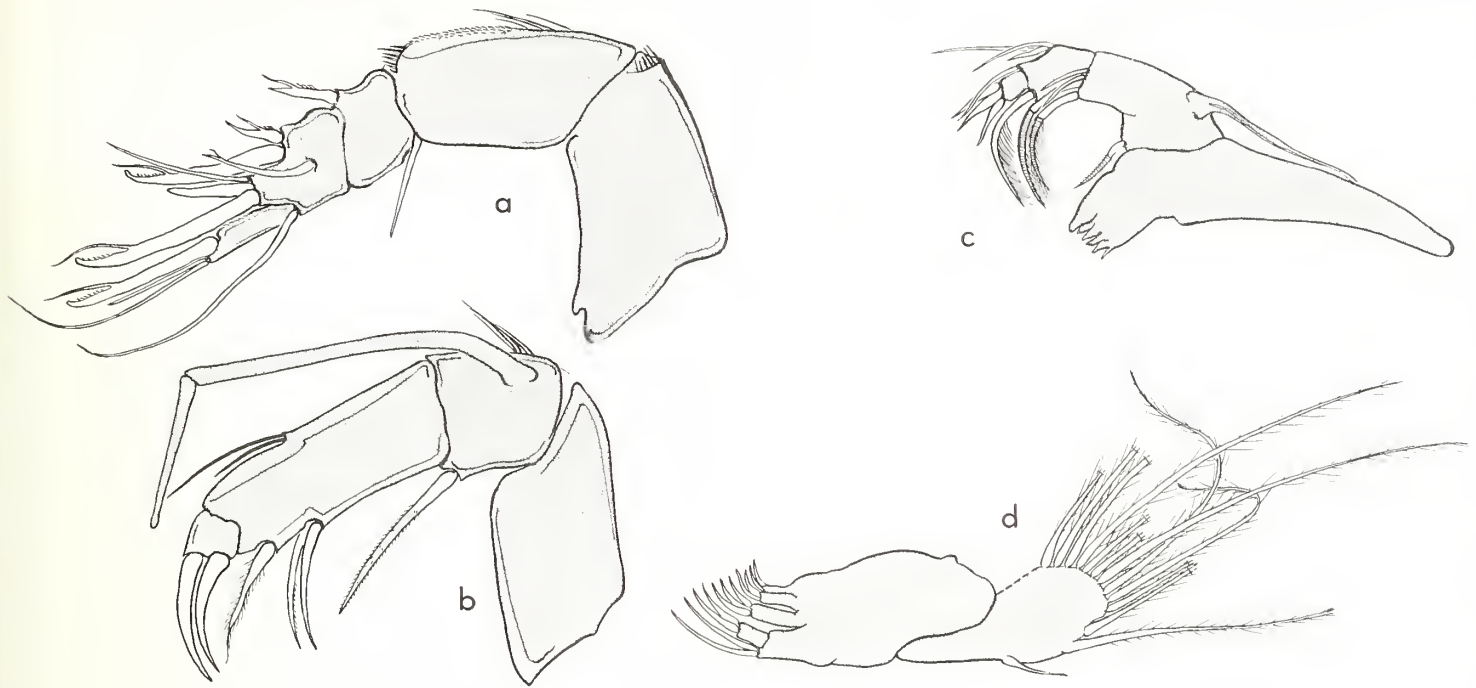


Text-fig. 1. ♂ RV, internal, transmitted light.
Radial pore canals. (x 154; 1976.1312).

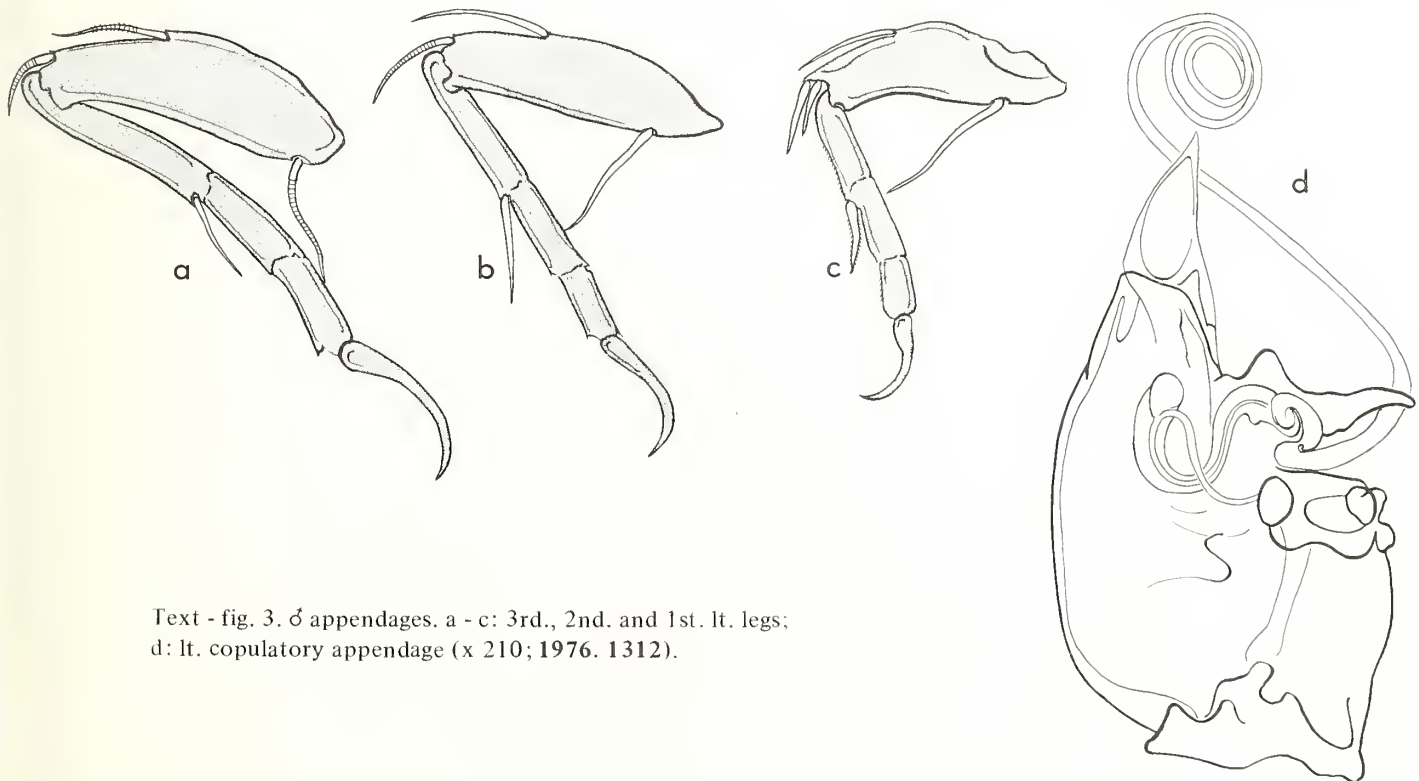
Explanation of Plate 4, 56

Fig. 1, ♂ car., pore and seta, anterodorsal area (1976.1308); figs. 2, 3, 5, 7, ♀ LV, int. lat. (1976.1309): fig. 2, int. view of pore showing sieve plate, post. area; fig. 3, musc. sc.; fig. 5, post. hinge; fig. 7, ant. hinge. Figs. 4, 6, ♀ RV, int. lat. (1976.1311): fig. 4, ant. hinge; fig. 6, post. hinge.
Scale A (10 µm; x 1500), fig. 1; scale B (5 µm; x 3000), fig. 2; scale C (50 µm; x 400), fig. 3; scale D (50 µm; x 300), figs. 4 - 7.





Text - fig. 2. ♂ appendages a: 1st. lt. antenna; b: 2nd. lt. antenna; c: lt. mandible; d: lt. maxilla (x 210; 1976.1312).



Text - fig. 3. ♂ appendages. a - c: 3rd., 2nd. and 1st. lt. legs; d: lt. copulatory appendage (x 210; 1976. 1312).

ON *CYTHERETTA JUDAEA* (BRADY)

by John Athersuch
(University of Leicester, England)

Genus *CYTHERETTA* Müller, 1894

Type-species (by monotypy): *Cytheretta rubra* Müller, 1894; here considered conspecific with *Ilyobates* (?) *judaea* Brady, 1868.

Diagnosis: Carapace elongate - ovate, shell thick. Marked asymmetry of valves; smooth or with ornament of longitudinal ribs. Hinge strong, holamphidont, anterior tooth prominent. Fulcral point developed into a strong pillar. Inner margin highly sinuous; numerous, unbranched radial pore canals anteriorly and posteriorly. First, and, in some species, second legs of male asymmetric.

Explanation of Plate 4, 60

Fig. 1, lectotype, ♂ LV, ext. lat. (Hancock Museum specimen, 720 μ m long); fig. 2, lectotype, ♂ RV, ext. lat. (Hancock Museum specimen, 720 μ m long); fig. 3, ♂ rt. car., ext. lat. (1976.1103, 804 μ m long).
Scale A (250 μ m; x 83), figs. 1, 2; scale B (250 μ m; x 75), fig. 3.

Cytheretta judaea (Brady, 1868)

- 1868 *Ilyobates* (?) *judaea* sp. nov. G.S. Brady, La côte de Syrie; in: *Les Fonds de la Mer*, L. De Folin & L. Perier, Paris, pt. 1, 112, pl. 13, figs. 17, 18.
1894 *Cytheretta rubra* sp. nov. G.W. Müller, *Fauna Flora Golf. Neapel* 21, 382, pl. 8, figs. 9, 10, 16; pl. 39, figs. 8 - 22, 24; non pl. 8, fig. 13.
1971 *Cytheretta subradiosa* (Roemer); P.J. Barbeito - Gonzalez, *Mitt. hamb. zool. Mus. Inst.* 67, 284, pl. 17, figs. 1a, 2a.
1972 *Cytheretta judaea* (Brady); M.C. Keen, *Bull. Br. Mus. nat. Hist. (Geol.)* 21, (6), 283, pl. 1, figs. 1, 4 - 7, 9, text-fig. 8.

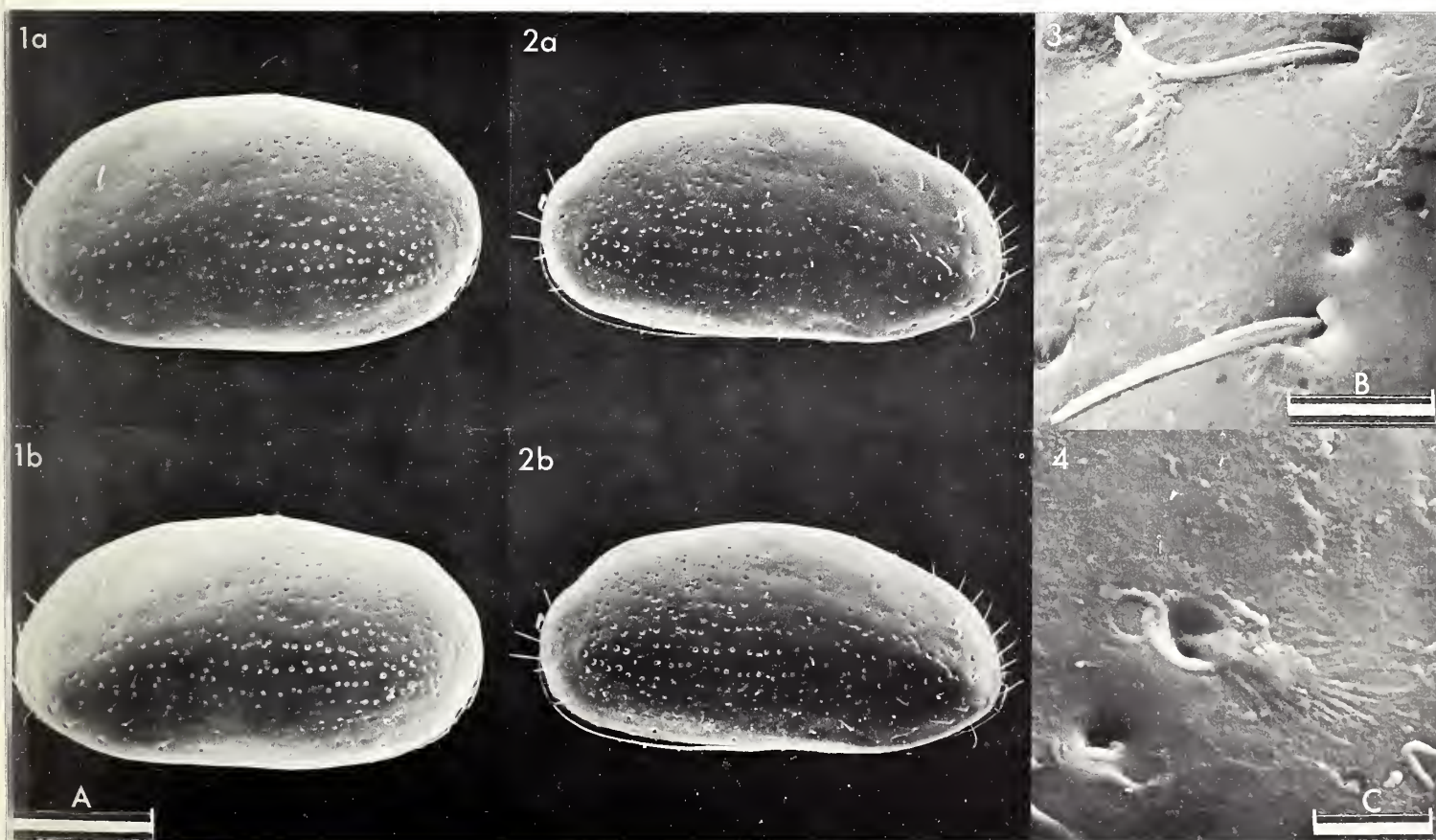
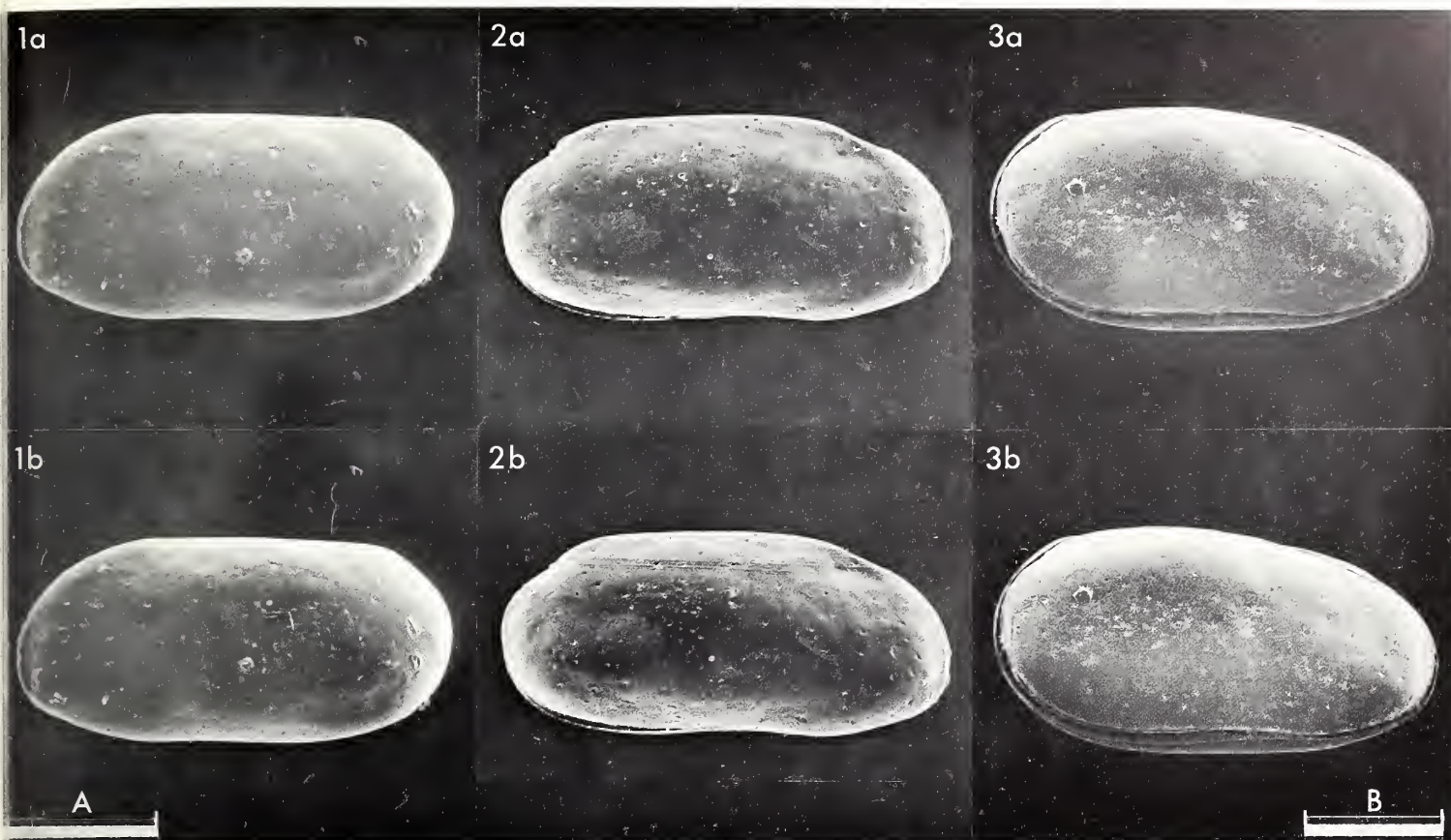
Lectotype: (here designated) ♂ LV, housed with the Brady collection, Hancock Museum, Newcastle-upon-Tyne; no catalogue number, but placed in a separate, labelled slide.

Type locality: Jaffa (Tel Aviv), coast of Israel, approx. lat. 32° 04'N, long. 34° 45'E; Recent.

Diagnosis: Surface unornamented but with irregular rows of small circular pores. Male copulatory appendages, distribution of radial pore canals and opaque areas distinctive.

Explanation of Plate 4, 62

Fig. 1, ♀ LV, ext. lat. (1976.1104, 756 μ m long); fig. 2, ♀ RV, ext. lat. (1976.1104); figs. 3, 4, ♀ RV, details of ornament (1976.1104).
Scale A (250 μ m; x 83), figs. 1, 2; scale B (25 μ m; x 800), fig. 3; scale C (10 μ m; x 1600), fig. 4.



Figured specimens: Hancock Museum specimen (δ LV: Pl. 4, 60, fig. 1; RV: Pl. 4, 60, fig. 2). Brit. Mus. (Nat. Hist.) 1976.1103 (δ car.: Pl. 4, 60, fig. 3); 1976.1104 (\varnothing LV: Pl. 4, 62, fig. 1; RV: Pl. 4, 62, figs. 2 - 4); 1976.1105 (\varnothing LV: Pl. 4, 64, fig. 1; Pl. 4, 66, figs. 3, 5); 1976.1106 (δ LV & soft parts: Pl. 4, 64, fig. 2); 1976.1107 (δ car.: Pl. 4, 64, fig. 3); 1976.1108 (\varnothing RV: Pl. 4, 66, fig. 1); 1976.1109 (δ RV: Pl. 4, 66, figs. 2, 4).

Nos. 1976.1103, 1109 from beach sand at Rimini, Italy, kindly given by Prof. Ruggieri. 1976.1107, ? sub-Recent from the Bay of Naples, given by Dr. G. Bonaduce. 1976. 1104, 1106 collected by Squ. Ldr. C.R. Chrisp in Cyprus; 1976.1104 from sand at 13m in Akrotiri Bay; 1976.1106 from sand at 40 m off Klidhes Island. 1976.1105 collected by the author during November, 1973, from near Cape Greco, Cyprus, approx. lat. $34^{\circ} 04'N$, long. $35^{\circ} 00'E$, in sand, water temperature $25^{\circ}C$, depth 8m, O_2 102%, salinity $39^0/00$.

Remarks: Brady (op. cit.) first recorded *Ilyobates* (?) *judaea* from Latakia, Syria (p. 110) and Jaffa, Israel (p. 112) but did not designate a type specimen. The specimens from Latakia are not in the Brady collection in the Hancock Museum, and are therefore presumed lost. However, two specimens from Jaffa remain undamaged. The lectotype has been selected from this material.

Müller (op. cit.) illustrated the carapace and soft parts of *Cytheretta rubra* sp. nov., here considered conspecific with *C. judaea*. Drawings of soft parts (herein) are based on a specimen from Müller's syntype collection (ex - 9308), now on separate, labelled slides housed in the Zoological Museum, E Berlin.

Explanation of Plate 4, 64

Fig. 1, \varnothing LV, int. lat. (1976.1105, 890 μm long); fig. 2, δ LV & soft parts (1976.1106, 800 μm long); fig. 3, δ car., vent. (1976.1107, 730 μm long).

Scale A (250 μm ; x 73), fig. 1; scale B (250 μm ; x 78), fig. 2; scale C (250 μm ; x 82), fig. 3.

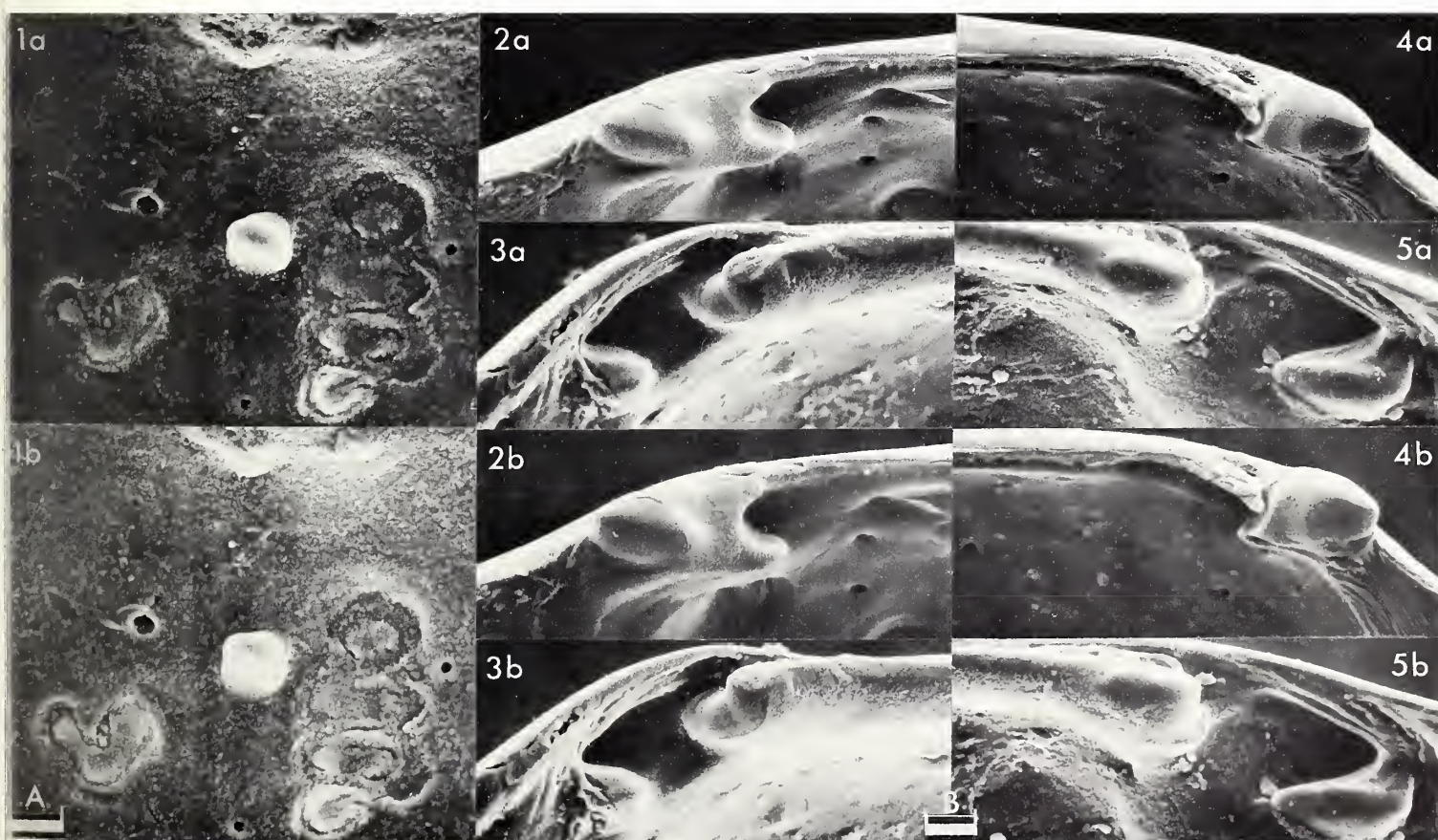
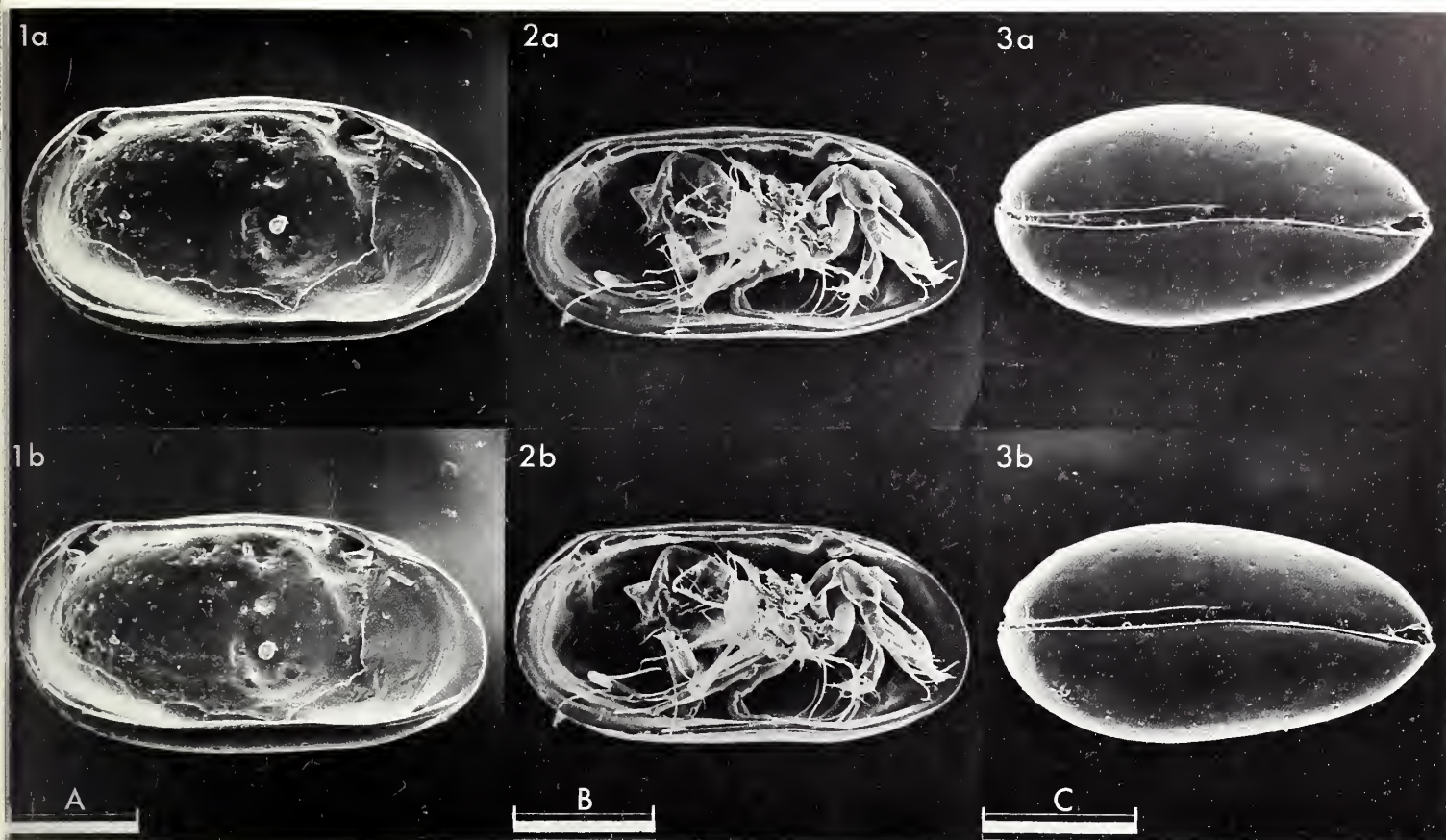
Remarks: This species has been considered by some authors (e.g. Ruggieri 1950, *G. Geol.* ser. 2, 21; Hazel (contd.) 1967, *Prof. Pap. U.S. geol. Surv.* no. 564) to be conspecific with *Cytherina subradiosa* Roemer, 1838 from the Pliocene of Castellarquato, Italy. Roemer's original material is lost (pers. comm. Prof. G. Ruggieri) and his description and illustration inadequately define this species. Keen (op. cit.) considered the Pliocene *C. subradiosa* (Roemer) to be distinct from the present species and with this I agree. For full details see Keen, op. cit., p. 281.

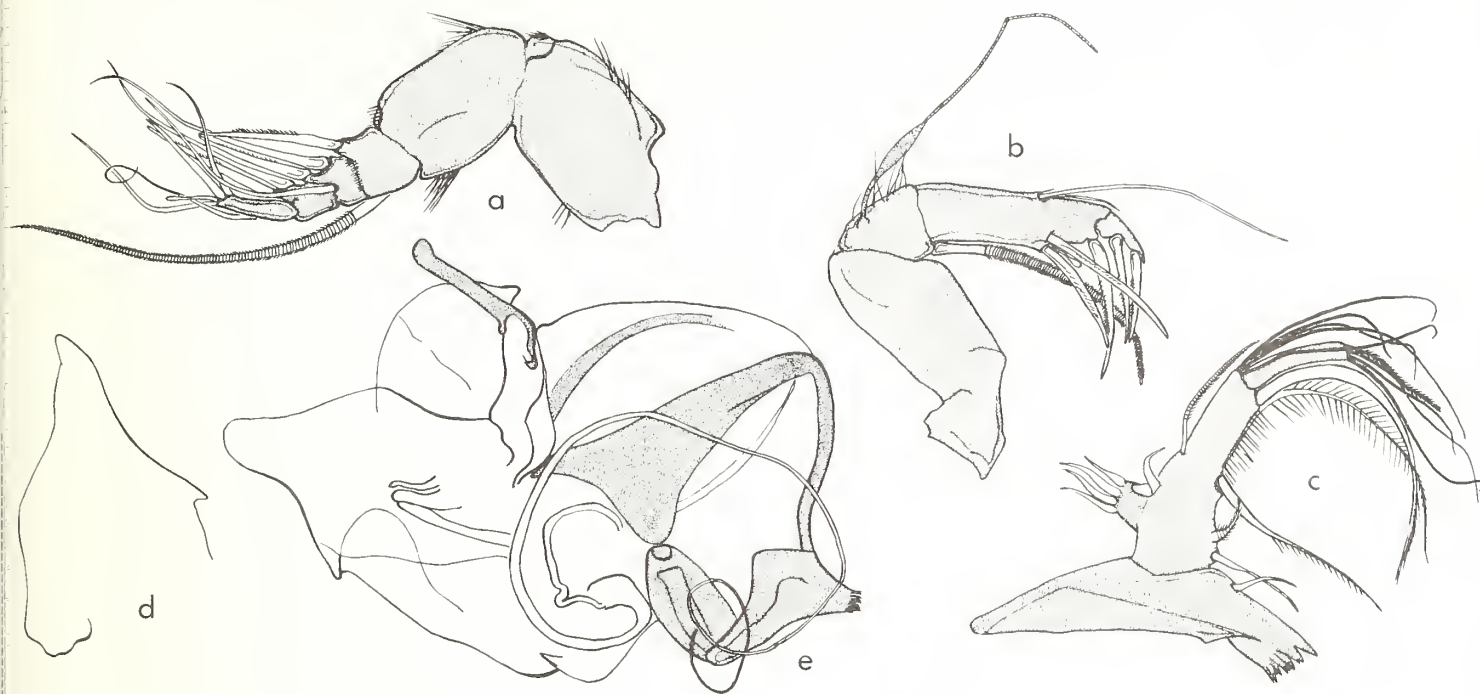
Distribution: Recent: coasts of Syria and Israel (Brady, op. cit.), the Aegean (Brady collection), the Adriatic (Ruggieri, op. cit. and others), Naples (Müller, op. cit.), Monaco (Rome 1942, *Monaco Inst. Oceanogr.*, Bull. 819), and Cyprus (herein).

Explanation of Plate 4, 66

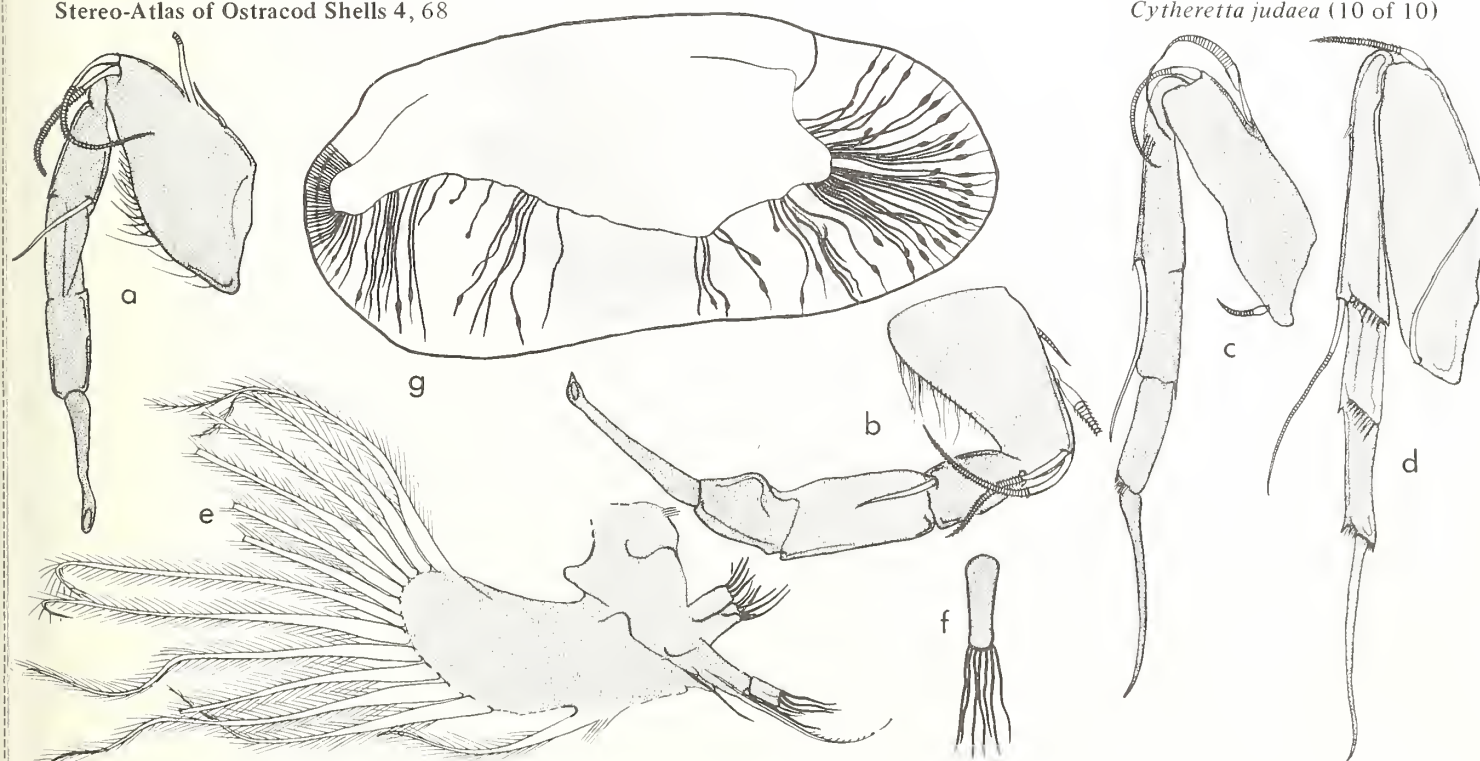
Fig. 1, \varnothing RV, int. lat. musc. sc. (1976.1108, 902 μm long); figs. 2, 4, δ RV, terminal hinge elements (1976.1109); figs. 3, 5 \varnothing LV, terminal hinge elements (1976.1105).

Scale A (25 μm ; x 290), fig. 1; scale B (25 μm ; x 262), figs. 2 - 5.





Text - fig. 1. ♂ appendages (x 190). a: 1st. lt. antenna; b: 2nd. rt. antenna; c: lt. copulatory appendage; d: distal part of rt. copulatory appendage; e: mandible.



Text - fig. 2. a - f. ♂ appendages (x 190). a: 1st. lt. leg; b: 1st. rt. leg; c: 2nd. lt. leg; d: 3rd. lt. leg; e: maxilla; f: brush shaped organ. 2. g: Radial pore canals and opaque areas of a ♂ RV from Cyprus (x 110).

ON *CYTHERETTA ADRIATICA* RUGGIERI

by John Athersuch
(University of Leicester, England)

Cytheretta adriatica Ruggieri, 1952

- 1866 *Cythere jurinei* Münster; G.S. Brady, *Trans. zool. Soc. Lond.* 5, 372, pl. 59, figs. 1a - f (non *C. jurinei* Münster, 1830).
1878 *Cythere jurinei* Münster; G.S. Brady, *Trans. zool. Soc. Lond.* 10, 305, pl. 65, fig. 2.
1950 *Cytheretta jurinei* (Münster); G. Ruggieri, *G. Geol.*, ser. 2, 21, 11, pl. 1, fig. 11, text-fig. 3.
1952 *Cytheretta adriatica* sp. nov. G. Ruggieri, *G. Geol.*, ser. 2, 22, 36.
1958 *Cytheretta ruggierii* sp. nov. H.S. Puri, *Trans. Gulf Coast Assoc. Geol. Soc.* 8, 186, pl. 2, figs. 1 - 5.
1971 *Cytheretta adriatica* Ruggieri; P.J. Barbeito-Gonzalez, *Mitt. hamb. zool. Mus. Inst.* 67, 285, pl. 17, figs. 1b, 2b, 3b.

Holotype: (not figured herein) Deposited in the Ruggieri collection, Institute of Geology, University of Bologna, Italy; no. 555.

Type locality: The bed of the Santerna River, S of Imola, N Italy, approx. lat. 44° 22'N, long. 11° 43'E; Milazzian (Quaternary), in a sub-littoral, grey sand.

Explanation of Plate 4, 70

Fig. 1, ♀ LV, ext. lat. (1976.1110, 1220 µm long); fig. 2, ♂ LV, ext. lat. (1976.1111, 1340 µm long); fig. 3, juv. - 1 RV, ext. lat. (1976.1112, 817 µm long).
Scale A (250 µm; x 53), figs. 1, 2; scale B (250 µm; x 62), fig. 3.

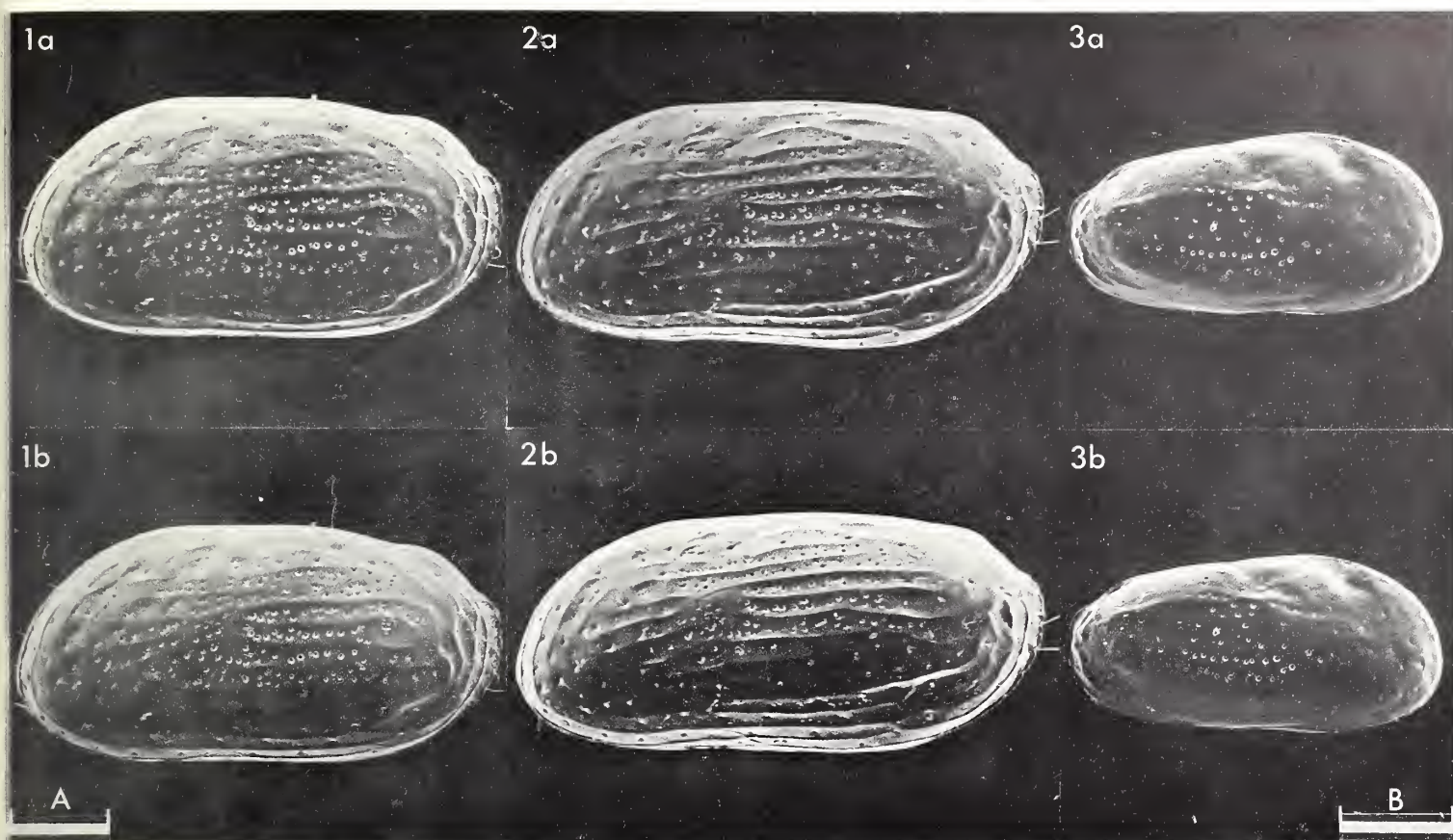
Figured specimens: Brit. Mus. (Nat. Hist.) 1976. 1110 (♀ LV: Pl. 4, 70, fig. 1; Pl. 4, 74, fig. 1); 1976.1111 (♂ LV: Pl. 4, 70, fig. 2; Pl. 4, 74, figs. 5, 6); 1976.1112 (juv. - 1: Pl. 4, 74, fig. 3); 1976.1113 (? ♂: Pl. 4, 72, fig. 1; text-fig. 1, a, c); 1976.1114 (♀ RV: Pl. 4, 72, fig. 2; LV: Pl. 4, 72, fig. 3); 1976.1115 (♂ LV: Pl. 4, 74, fig. 2); 1976.1116 (♂ RV & soft parts: Pl. 4, 74, fig. 3); 1976.1117 (♂ LV: Pl. 4, 74, fig. 4); 1976.1118 (♂ LV: Pl. 4, 76, figs. 1, 3, 5); 1976.1119 (♂ RV: Pl. 4, 76, figs. 2, 4). Text figs. 2, 3 are based on 1976.1110, 1111.

1976.1112 - 1114, 1117 - 1119 collected in Italy by Prof. G. Ruggieri; 1976.1112, 1117 from beach sand at Rimini; 1976.1114, 1118, 1119 from beach sand at Porto Corsini; 1976.1113 from the type locality. 1976.1115 from beach sand in Tunisia collected by Dr. G. Bonaduce. 1976.1110, 1111, 1116 collected alive in Cyprus by J. Athersuch; 1976.1110 from sand near Cape Greco, approx. lat. 34° 57'N, long. 34° 04'E, water depth 19m; 1976.1111 from sand near Cape Greco, approx. lat. 35° 00'N, long. 34° 04'E, water temperature 20.5°C, depth 12m, pH 8.2, O₂ 103%, salinity 39⁰/oo; 1976.1116 from sand outside Yialousa harbour, approx. lat. 35° 34'N, long. 34° 14'E, water temperature 21°C, depth 11m, pH 8.1, salinity 39⁰/oo.

Diagnosis: Carapace surface bears ridges of variable strength which run parallel to the dorsal and ventral margins and tend to coalesce posteriorly and sub-centrally. Soft parts distinctive.

Explanation of Plate 4, 72

Fig. 1, ? ♂ RV, ext. lat. (1976.1113, 951 µm long); fig. 2, ♀ RV, ext. lat. (1976.1114, 939 µm long); fig. 3, ♀ LV, ext. lat. (1976.1114).
Scale A (250 µm; x 64), figs. 1 - 3.



Remarks: In transmitted light, the distribution and number of radial pore canals appears to differ between the Recent and the few Quaternary specimens examined. The former have a greater number posteriorly and fewer anteriorly than the latter. These differences, however, are not considered sufficient to distinguish separate species (see Text - fig. 1).

Recent species of *Cytheretta* are characterised by the asymmetry of the first pair of legs in the male. In this species, there is extreme transformation, not only of the first, but also of the second male legs (See Hazel, 1967, *Prof. Pap. U.S. geol. Surv.* no. 564, 40). Living specimens are usually associated with shallow water sands.

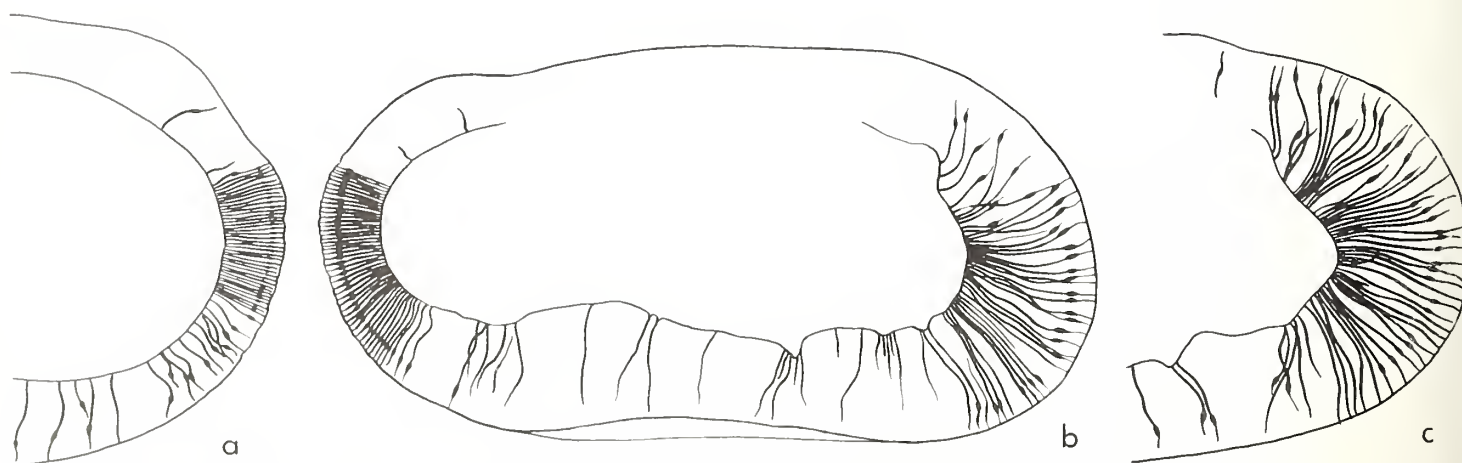
Distribution: Recent: Rimini, Italy (Puri, op. cit.); Naxos, Greece (Barbeito-Gonzalez, op. cit.); Cyprus, Tunisia and Porto Corsini, Italy (author's collection); Levant (Brady 1866). Quaternary: N Italy (Ruggieri 1950, op. cit.).

Explanation of Plate 4, 74

Fig. 1, ♀ RV, ext. lat. (1976.1110, 1220 μm long); fig. 2, ♀ LV & soft parts, int. lat. (1976.1116, 1122 μm long); fig. 3, ♂ LV, ext. lat. (1976.1115, 1049 μm long); fig. 4, ♂ LV, int. lat. (1976.1117, 1024 μm long); figs. 5, 6, ♂ LV, details of ornament and setae (1976.1111).

Scale A (250 μm ; x 45), figs. 1 - 4; scale B (25 μm ; x 473), fig. 5; scale C (10 μm ; x 1455), fig. 6.

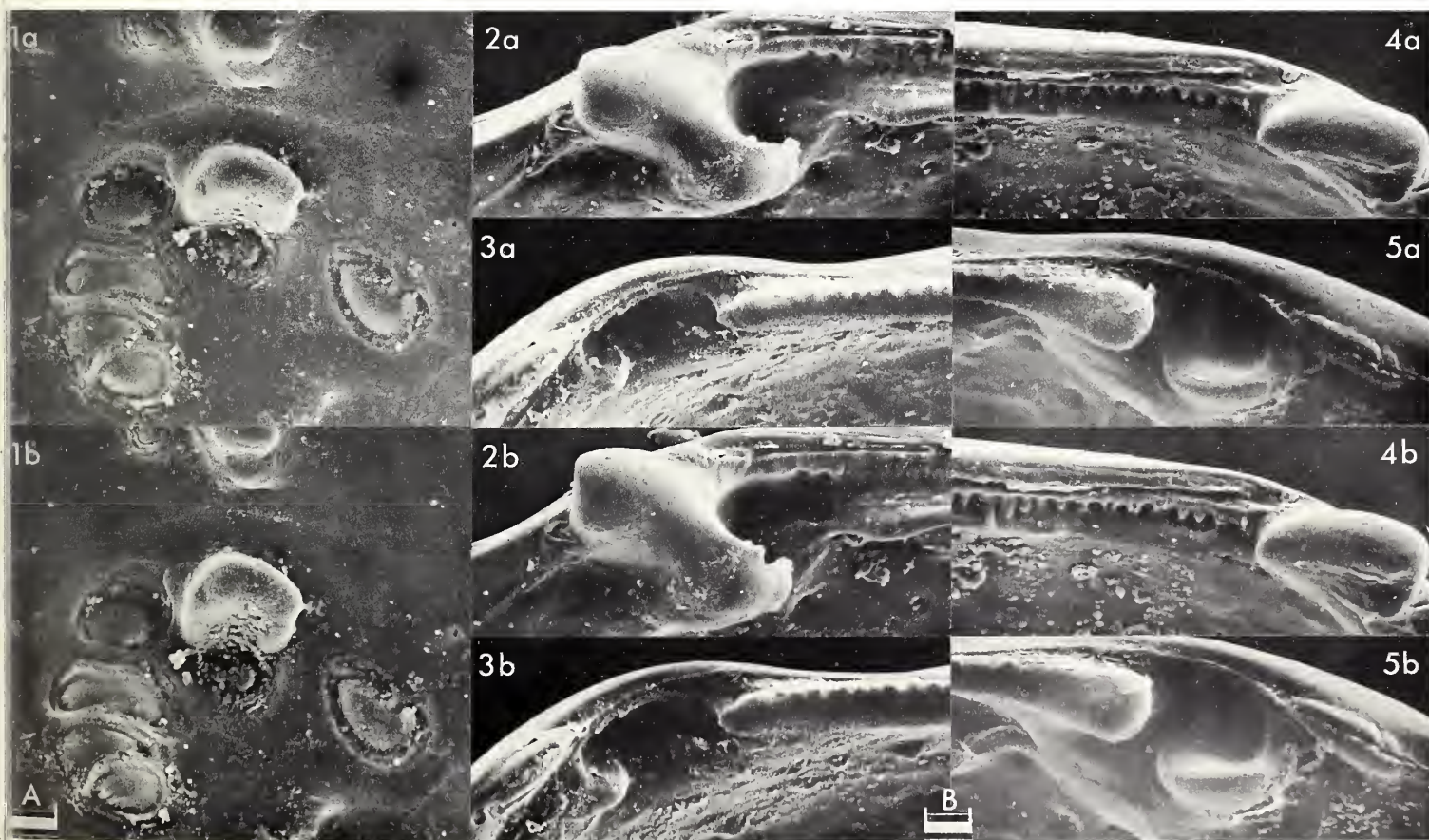
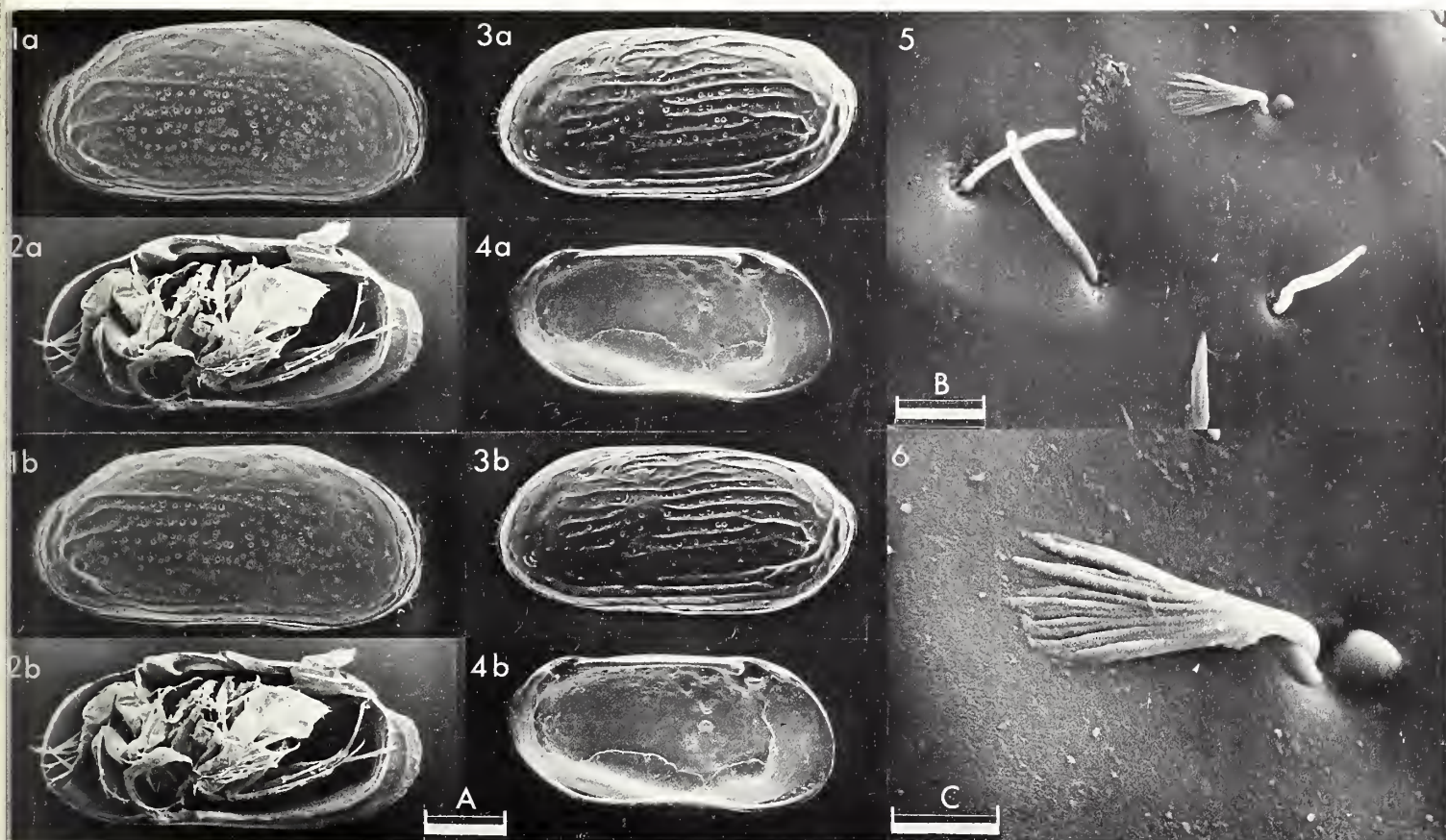
Text - fig. 1. Radial pore canals. a, c: post. LV and ant. RV of Quaternary specimen from type locality (1976.1113); b: RV of Recent specimen from Rimini, Italy. (x 85).



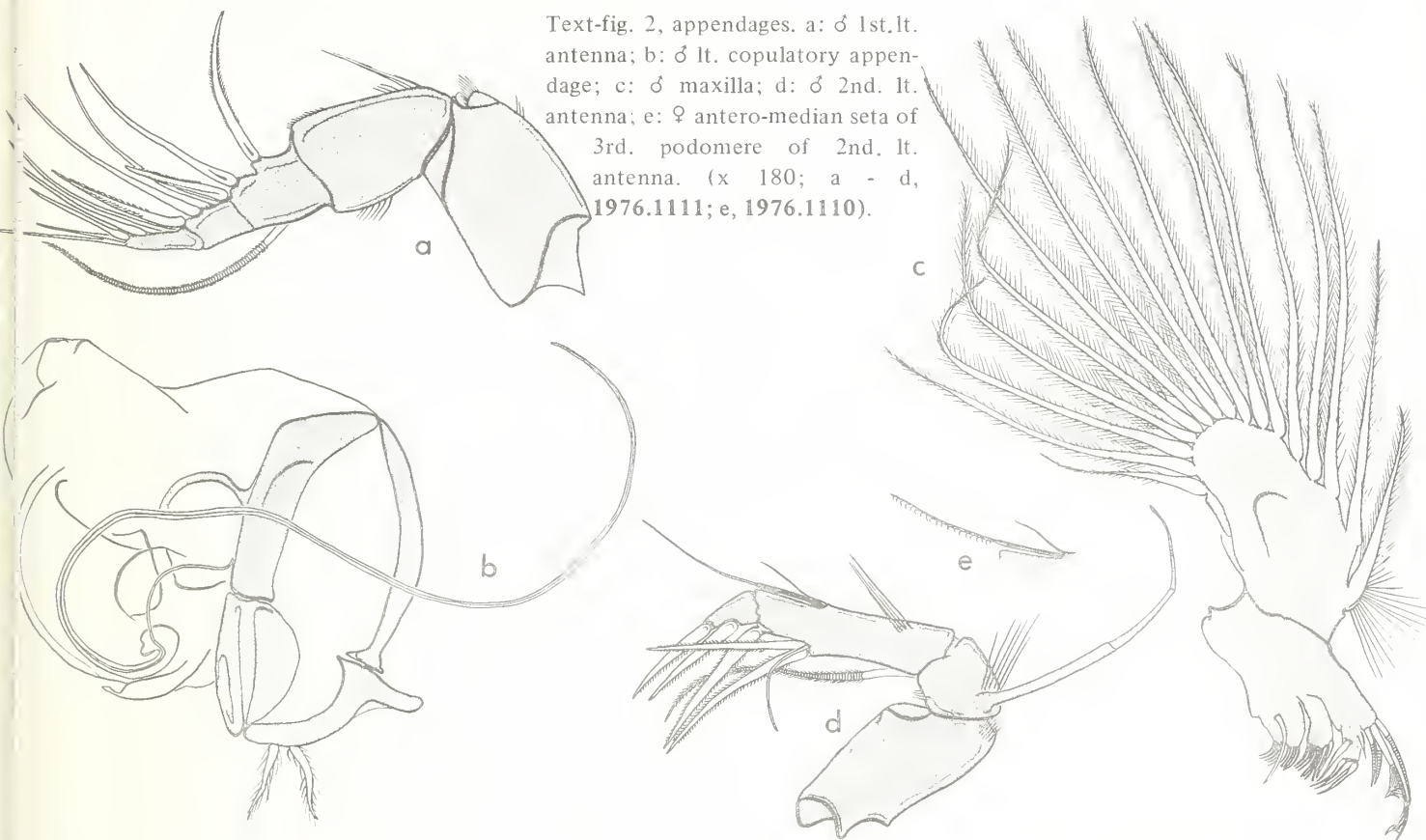
Explanation of Plate 4, 76

Fig. 1, ♂ LV, int. musc. sc. (1976.1118); figs. 2, 4 ♂ RV, terminal hinge elements (1976.1119); figs. 3, 5, ♂ LV, terminal hinge elements (1976.1118).

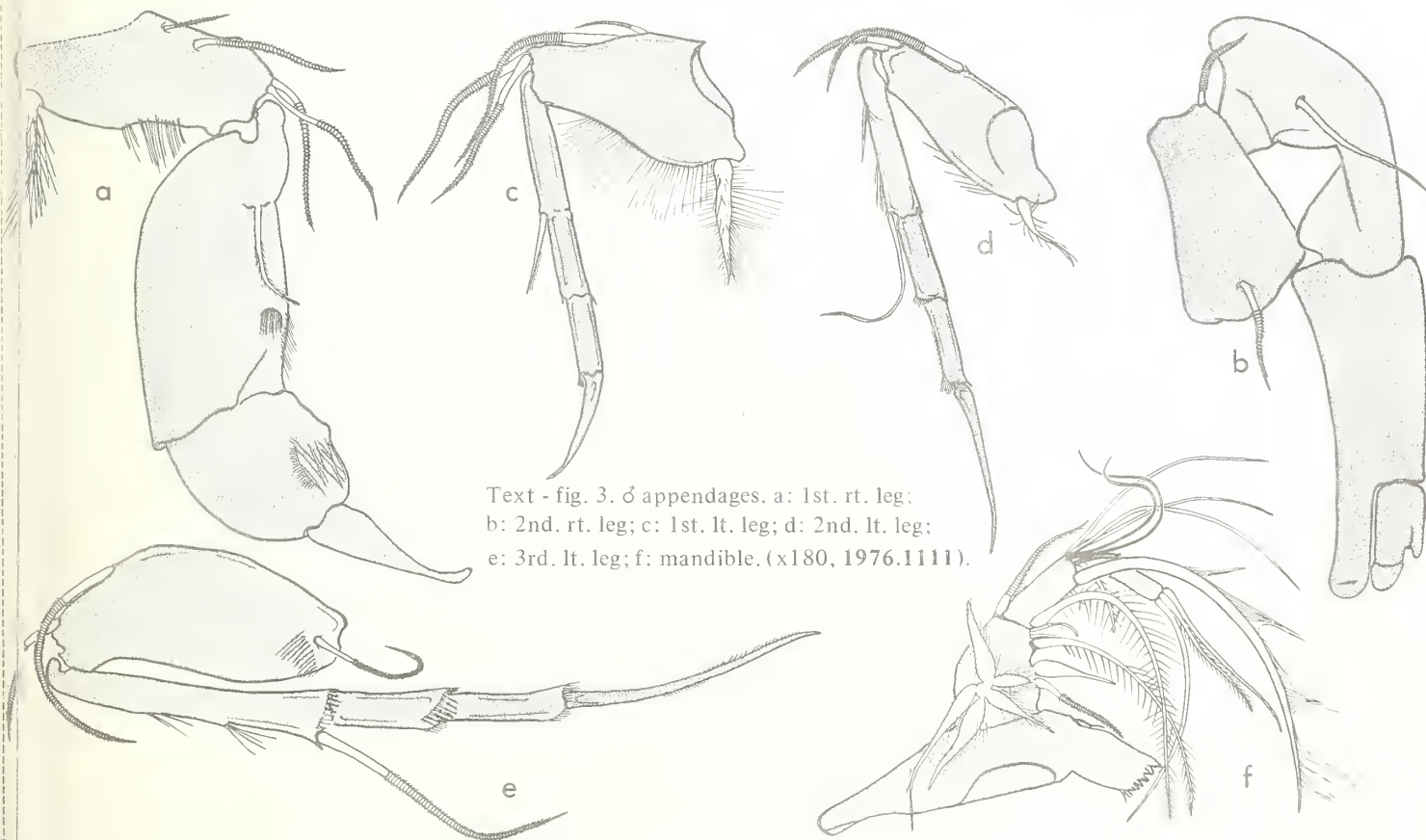
Scale A (25 μm ; x 290), fig. 1; scale B (25 μm ; x 230), figs. 3 - 5.



Text-fig. 2, appendages. a: ♂ 1st.lt. antenna; b: ♂ lt. copulatory appendage; c: ♂ maxilla; d: ♂ 2nd. lt. antenna; e: ♀ antero-median seta of 3rd. podomere of 2nd. lt. antenna. (x 180; a - d, 1976.1111; e, 1976.1110).



Text - fig. 3. ♂ appendages. a: 1st. rt. leg; b: 2nd. rt. leg; c: 1st. lt. leg; d: 2nd. lt. leg; e: 3rd. lt. leg; f: mandible. (x180, 1976.1111).



Stereo-Atlas of Ostracod Shells: Vol.4, Part 1

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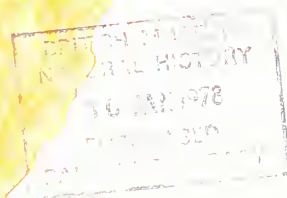
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edited by R.H. Bate, J. W. Neale, David J. Siveter and
P. C. Sylvester-Bradley

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ON *HETEROCYPRIDEIS MACROTUBERCULATA* MASSON & WHATLEY sp. nov.

by Douglas Masson and Robin Whatley
(University College of Wales, Aberystwyth)

Heterocyprideis macrotuberculata sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) no. OS 7593, ♀ RV. [Paratypes: nos. OS 7594 - OS 7598].

Type locality: British Petroleum engineering borehole, Forties Field, North Sea; lat. 57° 45'N, long. 0° 55'E. Quaternary, marine, muddy silt. Found from 0 - 45m below sediment surface.

Derivation of name: Alluding to the large and prominent subcentral tubercle.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. OS 7593 (holotype, ♀ RV: Pl. 4, 80, fig. 1; Pl. 4, 84, figs. 1, 2; Pl. 4, 86, fig. 3), OS 7594 (♀ LV: Pl. 4, 84, fig. 3), OS 7595 (♂ LV: Pl. 4, 82 fig. 1), OS 7596 (♂ RV: Pl. 4, 80 fig. 2), OS 7598 (♀ RV: Pl. 4, 82, fig. 2; Pl. 4, 86, figs. 1, 2). All the figured specimens are from sample 3 (13), 22m below sediment surface, Forties Field, North Sea.

Explanation of Plate 4, 80

Fig. 1, ♀ RV, ext. lat. (holotype, OS 7593, 900 µm long); fig. 2, ♂ RV, ext. lat. (OS 7596, 880 µm long).
Scale A (200 µm; x 80), figs. 1, 2.

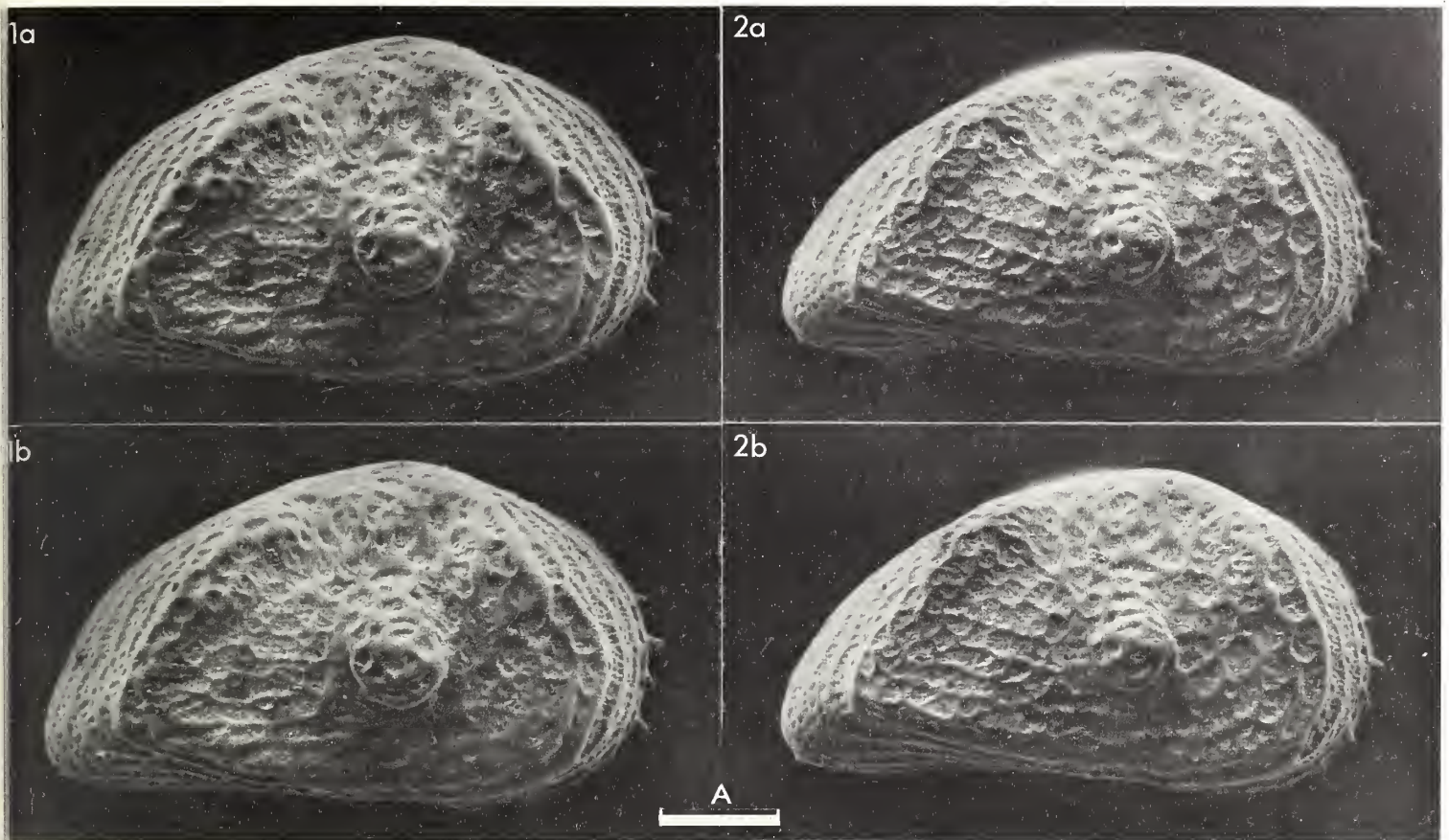
Diagnosis: Strongly and irregularly reticulate with subcentral tubercle strong, prominent and reticulate. Free margin surrounded by four ridges between which are puncta. Posterior loop subperipheral.

Remarks: All three species of the genus are confined to the Northern Atlantic and Arctic. The present species differs radically from *H. sorbyana* (Jones) (*Palaeontogr. Soc. [Monogr.]* 1856), the latter lacking subcentral tubercle and peripheral ridges. *H. fascis* (Brady & Norman, 1889) (*Scient. Trans. R. Dubl. Soc. (2)* 4), is more similar but is smaller, less strongly ornamented and has a more peripherally situated posterior loop. *H. macrotuberculata* occurs most commonly with *H. sorbyana* (Jones), *Eucytheridea bradii* (Norman), *Eucytheridea punctillata* (Brady), *Elofsonella concinna* (Jones), *Trachyleberis dunelmensis* (Norman), and several species of *Cytherepteron*, the most common being *C. arcuatum* Brady, Crosskey & Robertson and *C. nodosum* Brady. This indicates that the species is marine. It has only been recovered from fine grained sediments and probably inhabits waters of no great depth on the continental shelf.

Distribution: This species appears to be confined to the top 45m of the 130m of the Quaternary succession studied to date in the Forties Field. It only occurs in large numbers in one sample, at a depth of 22m below the sediment surface. There are no published records of the species.

Explanation of Plate 4, 82

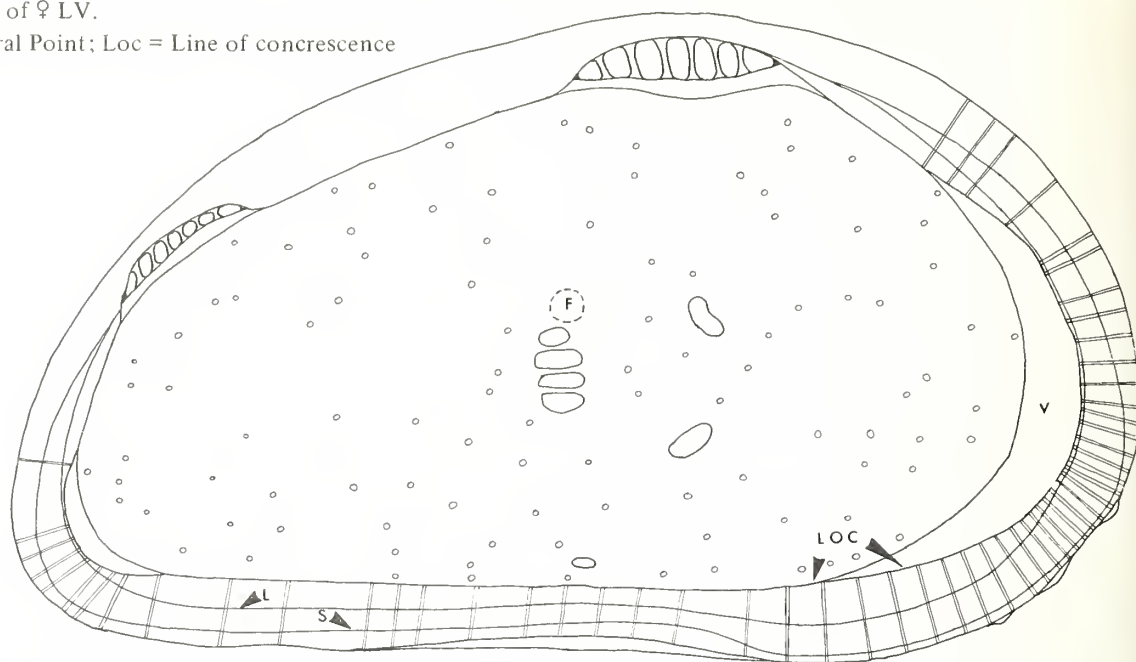
Fig. 1, ♂ LV, ext. lat. (OS 7595, 950 µm long); fig. 2, ♀ RV, int. lat. (OS 7598, 910 µm long).
Scale A (200 µm; x 80), figs. 1, 2.



Text - fig. 1. Internal view of ♀ LV.

V = Vestibulum; F = Fulcral Point; Loc = Line of concrescence

S = Selvage; L = List.



Explanation of Plate 4, 84

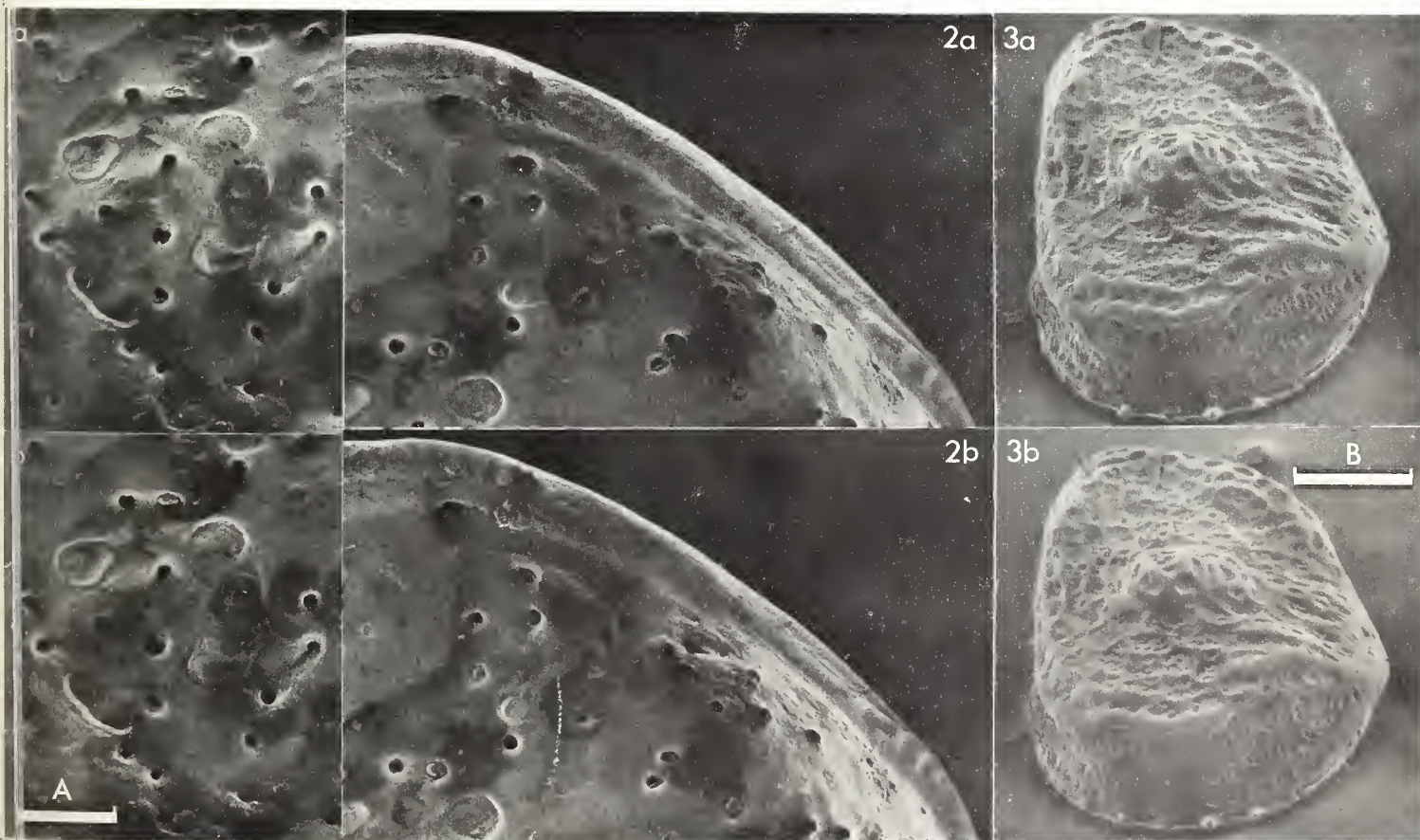
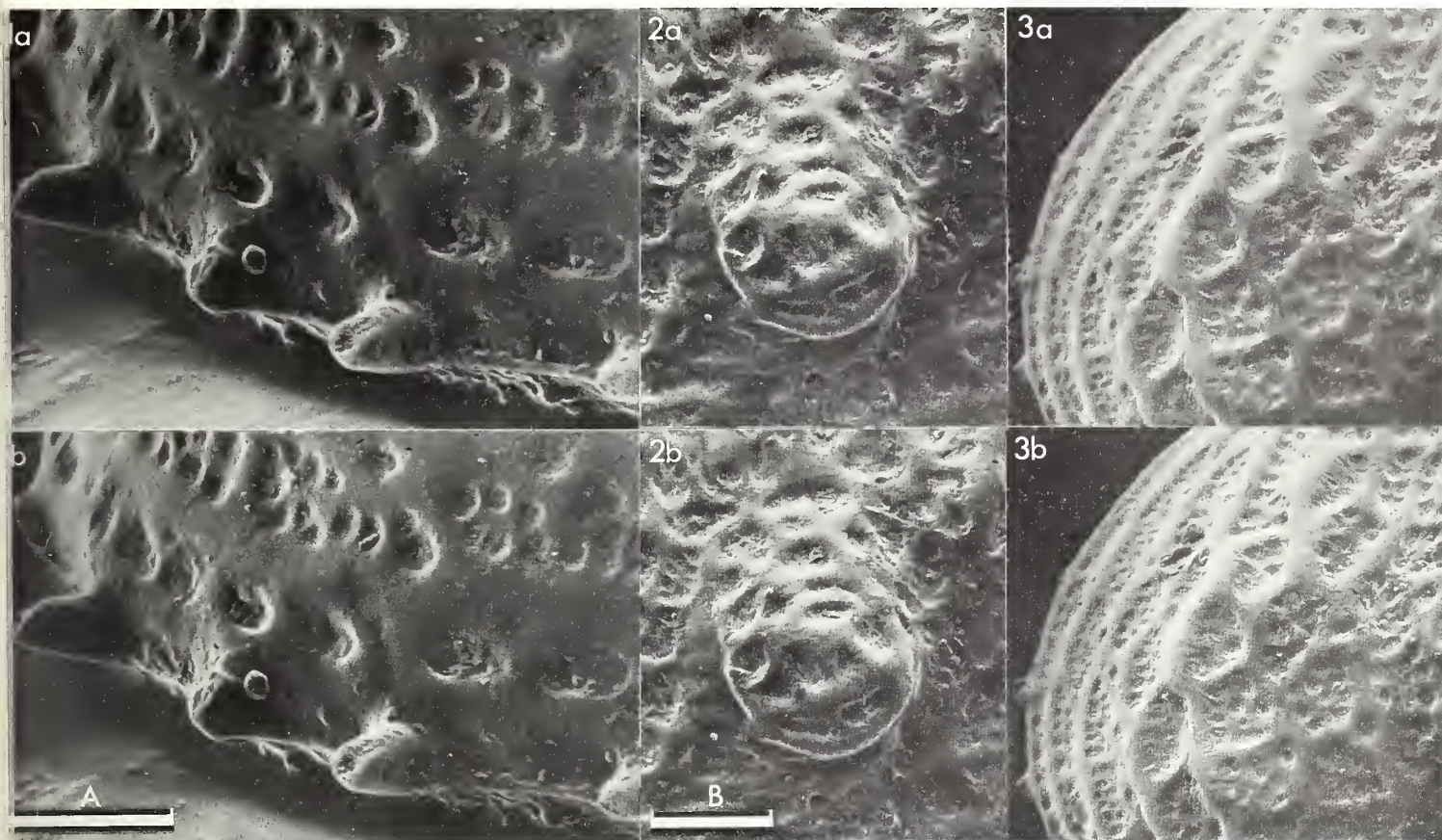
Figs. 1, 2, ♀ RV (holotype, OS 7593): fig. 1, ext. ant. spines; fig. 2, ext. lat., subcentral tubercle. Fig. 3, ♀ LV, (OS 7594, 950 μm long), ext. lat., detail of ornament.

Scale A (50 μm ; x 450), fig. 1; scale B (100 μm ; x 160), figs. 2, 3.

Explanation of Plate 4, 86

Figs. 1, 2, ♀ RV (OS 7598): fig. 1, int. lat., detail of musc. sc.; fig. 2, int. lat., hinge. Fig. 3, ♀ LV (holotype, OS 7593), ext. obl. ant.

Scale A (100 μm ; x 160), figs. 1, 2; scale B (200 μm ; x 80), fig. 3.



ON *PROGONOCY THERE RETICULATA* BATE

by Lesley M. Sheppard
(British Museum [Natural History], London)

Progonocythere reticulata Bate, 1963

- 1963 *Progonocythere reticulata* sp. nov. R.H. Bate, *Bull. Br. Mus. nat. Hist.(Geol.)* 9, 2, 27, pl.1, figs. 7 - 13, pl.2, figs. 1 - 11.
1966 *Glyptocythere reticulata* (Bate); E Brand & H.Malz, *Senckenberg. leth.* 47, pl.60, figs. 94, 95.

Holotype: Brit. Mus. (Nat. Hist.) **IO 909**, ♀ carapace.

Type locality: Basement Beds (marl facies), Bajocian, Eastfield Quarry, S Cave, Yorkshire, England. Grid. Ref.: SE 913323.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. **IO 909** (♀ car.: Pl. 4, 88, fig. 1), **IO 913** (♂ LV: Pl. 4, 88, fig. 2), **IO 917** (♂ RV: Pl. 4, 88, fig. 3), **IO 5498** (♀ LV: Pl. 4, 90, fig. 1), **IO 5499** (♀ car.: Pl. 4, 90, fig. 3), **IO 5500** (♂ car.: Pl. 4, 90, fig. 2). All specimens are from the type locality and level.

Explanation of Plate 4, 88

Fig. 1, ♀ car., ext. rt. lat.(holotype, **IO 909**, 595 µm long); fig. 2, ♂ LV, ext. lat. (paratype, **IO 913**, 663 µm long); fig. 3, ♂ RV, ext. lat. (paratype, **IO 917**, 654 µm long).
Scale A (100 µm; x 94), fig. 1; scale B (200 µm; x 98), figs. 2, 3.

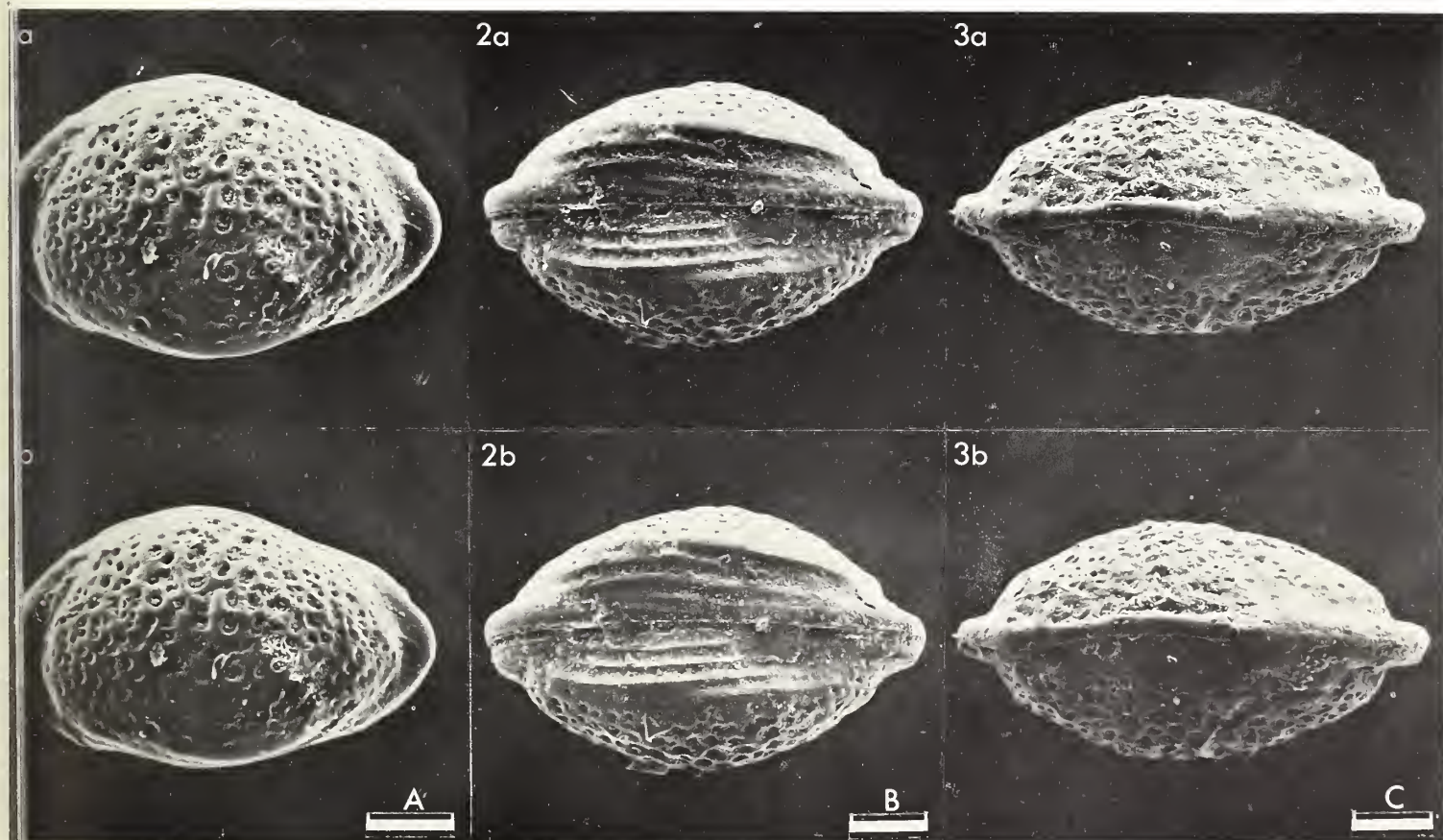
Diagnosis: Species of *Progonocythere* with strongly reticulate shell surface, the ornamentation comprising 4 - 5 sided pits which increase in size towards the centre of the carapace.

Remarks: This is the most ornate of all *Progonocythere* species and the oldest of the *Progonocythere*/*Glyptocythere* lineage. Features characteristic of both genera can be seen but the shape and form of both dimorphs so strongly resemble that of *P. cristata* Bate, particularly the concave posterodorsal slope well displayed in the male, that it is here considered a species of *Progonocythere*. Currently it is used as the index species of the *P. reticulata* Subzone (lower part of the *discites ammonite* zone) at the base of the Bajocian.

Distribution: A marine species. Apart from the type locality where it is a common ostracod it has so far only been found elsewhere in the Hydraulic Limestone of Kirkham Priory and near Castle Howard, Yorkshire, England.

Explanation of Plate 4, 90

Fig.1, ♀ LV, ext. lat. (**IO 5498**, 544 µm long); fig. 2, ♀ car., ext. vent. (**IO 5499**, 612 µm long); fig. 3, ♂ car., ext. dors. (**IO 5500**, 646 µm long).
Scale A (100 µm; x 110), fig. 1; scale B (100 µm; x 98), fig. 2; scale C (100 µm; x 100), fig. 3.



ON *GLYPTOCY THERE OSCILLUM* JONES & SHERBORN

by Lesley M. Sheppard
(British Museum [Natural History], London)

Glyptocythere oscillum (Jones & Sherborn, 1888)

1888 *Cythere oscillum* sp. nov. T.R.Jones & C.D.Sherborn, *Proc. Bath Nat. Hist. Fld. Cl.* **6**, 254, pl. 3, figs. 8a - c.

1888 *Cytheridea sriblita* sp. nov. T.R. Jones & C.D.Sherborn, *Ibid.*, p. 268, pl. 3, figs. 7a - c.

1969 *Glyptocythere oscillum* (Jones & Sherborn); R.H.Bate, *Bull. Br. Mus. nat. Hist. (Geol.)* **17**, 8, 412, pl. 5, fig. 2, pl. 12, fig. 2.

Holotype: Brit. Mus. (Nat. Hist.) **I 1849**, ♀ RV.

Type locality: Blue Fullers' Earth Clay, Bathonian; Midford, Somerset, England. Grid. Ref.: ST 765605.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. **I 1849** (♀ RV: Pl. 4, 92, fig. 1), **I0 3916** (♂ RV: Pl. 4, 92, fig. 3), **I0 3943** (♂ LV: Pl. 4, 94, fig. 3), **I0 5495** (♂ LV: Pl. 4, 94, fig. 2), **I0 5496** (♀ car.: Pl. 4, 94, fig. 5), **I0 5497** (♀ RV: Pl. 4, 94, fig. 1), **I0 5501** (♀ LV: Pl. 4, 92, fig. 2; Pl. 4, 94, fig. 4), **I0 5502** (♀ car.: Pl. 4, 94, fig. 6). Nos. **I 1849**, **I0 3916**, **I0 3943** are all from the type locality and level. **I0 5501** is from depth 20.50m - 20.80m, Bathonian, Upper Fullers' Earth, Horsecombe Vale, I.G.S. Borehole 15, Somerset, England; Grid. Ref.:

Explanation of Plate 4, 92

Fig. 1, ♀ RV, ext. lat. (holotype, **I 1849**, 552 µm long); fig. 2, ♀ LV, ext. lat. (**I0 5501**, 484 µm long); fig. 3, ♂ RV, ext. lat. (**I0 3916**, 578 µm long).

Scale A (100 µm; x 108), fig. 1; scale B (100 µm; x 123), fig. 2; scale C (100 µm; x 112), fig. 3.

Figured specimens: ST 755622. **I0 5495** is from depth 10.30m - 10.60m, Upper Fullers' Earth, Horsecombe Vale Borehole (contd.) 15. **I0 5496** is from depth 48.73m - 49.60m, Upper Fullers' Earth, Baggridge, I.G.S. Borehole 2, Somerset; Grid Ref.: ST 741560. **I0 5497** and **I0 5502** are both from the Combe Down Oolite, Baggridge Borehole (depths 8.23m - 9.50m and 12.18 - 13.40m respectively).

Diagnosis: Species of *Glyptocythere* having a carapace strongly ornamented by two lateral grooves which are joined by a narrow vertical groove passing between two irregular swollen areas. A broad dorso-median sulcus extends down to the median groove.

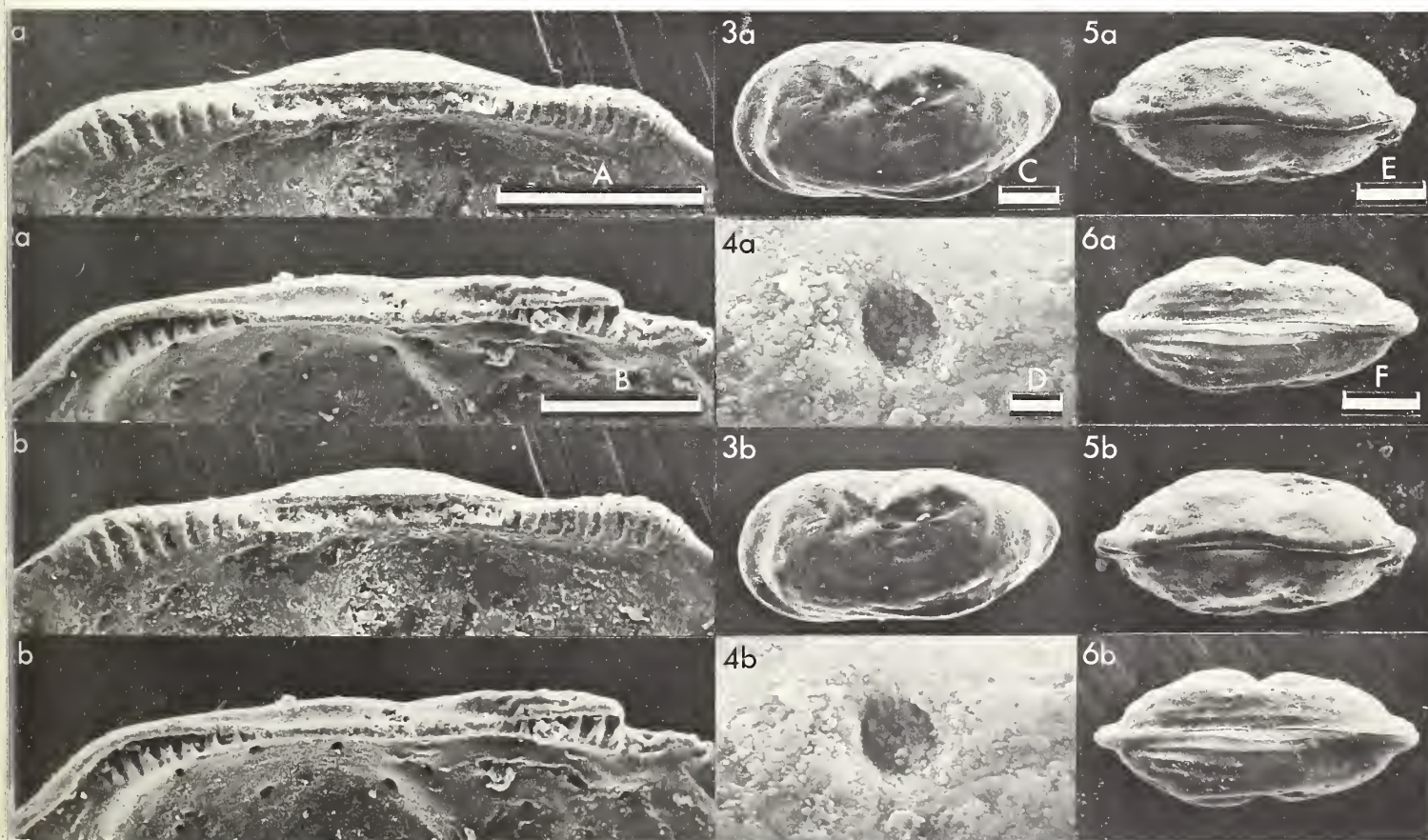
Remarks: Cardinal angles particularly well developed in the right valve. Normal pore canals prominently displayed over carapace and yield sieve plates. Hinge has 5 - 6 terminal teeth in the right valve, a median loculate groove and is regarded as entomodont. *G. oscillum* is currently being used as the index ostracod indicating the base of ostracod zone 5 at the top of the *hodsoni* ammonite zone.

Distribution: A marine species so far found in the Bathonian, Blue Fullers' Earth Clay, Midford, Somerset; the Combe Down Oolite and Upper Fullers' Earth, I.G.S. borehole no. 2, Baggridge, Somerset; the Upper Rags, I.G.S. borehole no. 3, Baggridge, Somerset; the Upper Fullers' Earth, Horsecombe Vale, Somerset, and the Cornbrash, Kirtlington Cement Quarry, Oxon, England.

Explanation of Plate 4, 94

Fig. 1, ♀ RV, int. lat. hinge (**I0 5497**); fig. 2, ♂ LV, int. lat. hinge (**I0 5495**); fig. 3, ♂ RV, ext. lat. (lectotype of *C. sriblita*, **I0 3943**, 620 µm long); fig. 4, normal pore canal (**I0 5501**); fig. 5, ♀ car., ext. dors. (**I0 5496**, 510 µm long); fig. 6, ♀ car., ext. vent. (**I0 5502**, 476 µm long).

Scale A (100 µm; x 278), fig. 1, scale B (100 µm; x 211), fig. 2; scale C (100 µm; x 72), fig. 3; scale D (10 µm; x 647), fig. 4; scale E (100 µm; x 88), fig. 5; scale F (100 µm; x 94), fig. 6.



ON *GLYPTOCY THERE SCITULA* BATE

by Lesley M. Sheppard
(British Museum [Natural History], London)

Glyptocythere scitula Bate, 1965

1965 *Glyptocythere scitula* sp. nov. R.H. Bate, *Bull. Br. Mus. nat. Hist. (Geol.)* **11**, 3, 108, pl. 7, figs. 1 - 13, pl. 8, figs. 1 - 9, pl. 9, figs. 1 - 4.

Holotype: Brit. Mus. (Nat. Hist.) **IO 1750**, ♀ carapace.

Type locality: Bed 5, *Glyptocythere scitula* Zone, Grey Limestone Series, Bajocian; Yons Nab Headland, Cayton Bay, Yorkshire, England. Grid. Ref.: TA 082843.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. **IO 1750** (♀ car.: Pl. 4, 96, fig. 1; Pl. 4, 98, fig. 4), **IO 1751** (♂ LV: Pl. 4, 98, fig. 3), **IO 1754** (♀ LV: Pl. 4, 96, fig. 2), **IO 1756** (♀ RV: Pl. 4, 98, fig. 2), **IO 1765** (♂ car.: Pl. 4, 98, fig. 5), **IO 1772** (♂ RV: Pl. 4, 96, fig. 3), **IO 1774** (♂ RV: Pl. 4, 98, figs. 1, 6). Nos. **IO 1750**, **IO 1751**, **IO 1754**, **IO 1756** are all from the type locality and level. **IO 1765** is from bed 10, Bajocian, Hawsker, Yorkshire; Grid. Ref.: NZ 937079. **IO 1772** is from bed 5, Bajocian, Gristhorpe Bay, Yorkshire; Grid. Ref.: TA 085842. **IO 1774** is from base bed 12, Bajocian, Ravenscar, Yorkshire, England; Grid. Ref.: NZ 988012.

Explanation of Plate 4, 96

Fig. 1, ♀ car., ext. rt. lat. (holotype, **IO 1750**, 714, μ m long); fig. 2, ♀ LV, ext. lat. (paratype, **IO 1754**, 731 μ m long); fig. 3, ♂ RV, ext. lat. (paratype, **IO 1772**, 833 μ m long).
Scale A (200 μ m; x 84), fig. 1; scale B (200 μ m; x 82), fig. 2; scale C (200 μ m; x 78), fig. 3.

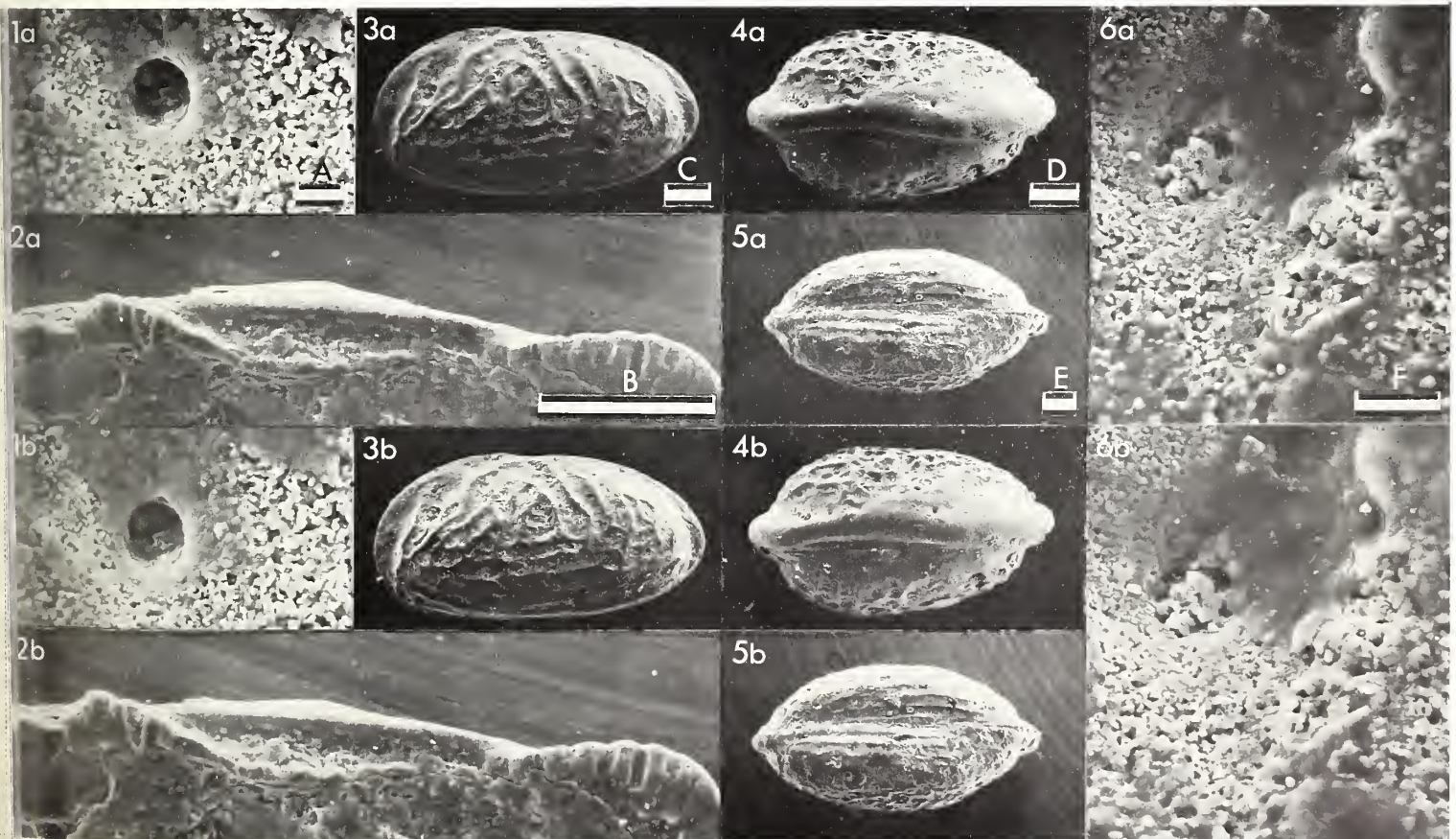
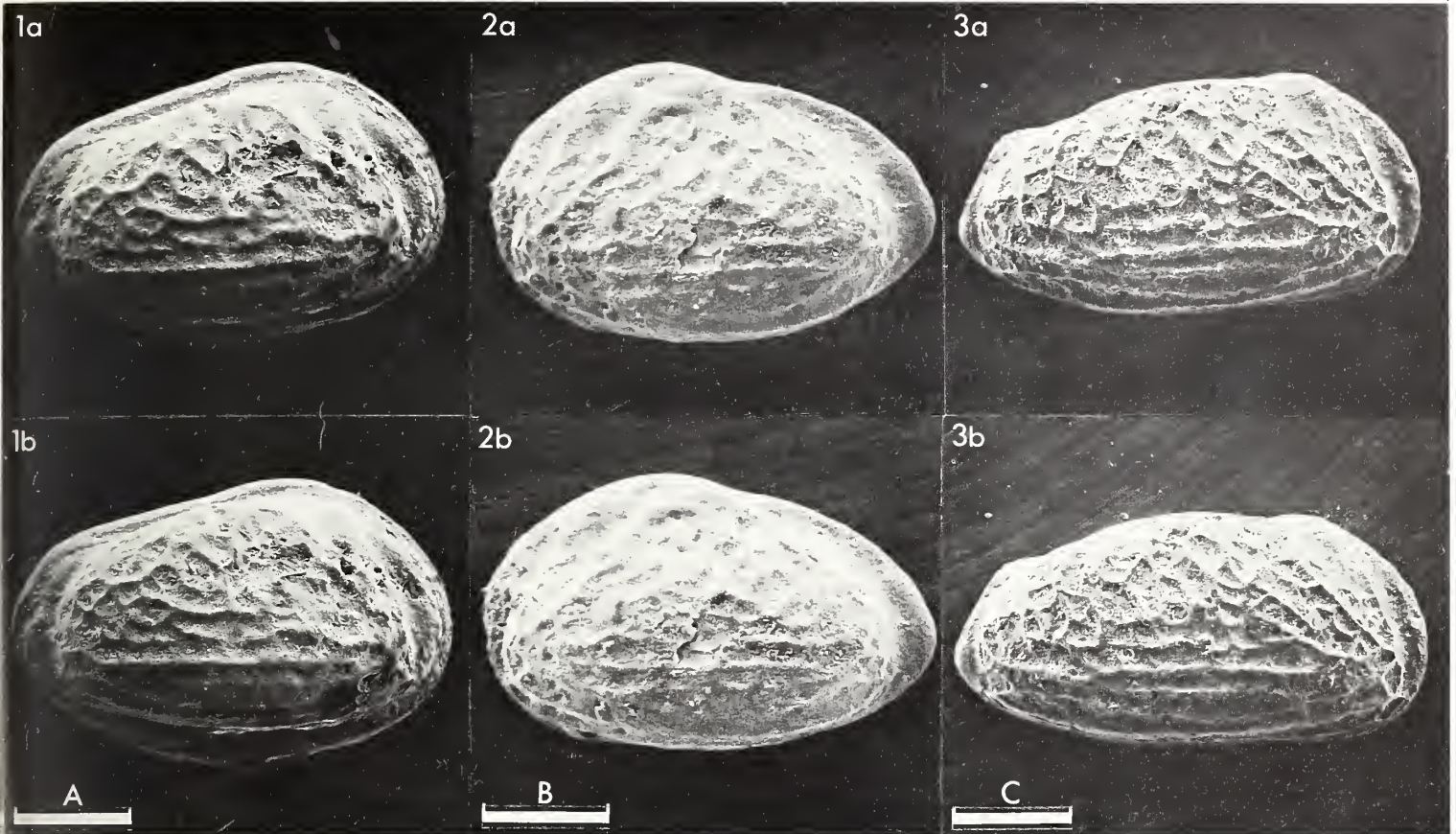
Diagnosis: Large subquadrate to elongate species of *Glyptocythere*. Strongly developed ornamentation of carapace comprising branching and anastomosing ridges, radiating from dorsal margin. Ventral and ventro-lateral surfaces ornamented with longitudinal ridges, some of which tend to bend upwards anteroventrally.

Remarks: The dorsal margin in the left valve as seen in the holotype (Pl. 4, 96, fig. 1) projects above that of the right valve and is considerably thicker, almost keel-like. Normal pore canals are large and rounded and particularly evident in those specimens with more poorly developed ornamentation. Hinge is entomodont. The specimens figured here all closely resemble the holotype in their diagnostic features. The species, however, includes many unlike forms and is under review at present.

Distribution: A marine species. Found in the Bajocian as the index species of the *G. scitula* Zone (= *humphriesianum* ammonite zone) in the upper part of the Grey Limestone Series of Gristhorpe Bay, Cayton Bay, White Nab, Hundale Point, Ravenscar, Hawsker, Bloody Beck, May Beck, Eller Beck, Harland Beck, Bogmire Gill, Yearsley Moor and Stonecliff Wood, Yorkshire, England (Bate, op. cit.).

Explanation of Plate 4, 98

Fig. 1, ♂ RV, int. normal pore canal (paratype, **IO 1774**); fig. 2, ♀ RV, int. hinge (paratype, **IO 1756**); fig. 3, ♂ LV, ext. lat. (paratype, **IO 1751**, 824 μ m long); fig. 4, ♀ car., ext. dors. (holotype, **IO 1750**, 714 μ m long); fig. 5, ♂ car., ext. vent. (paratype, **IO 1765**, 952 μ m long); fig. 6, ♂ RV, int. musc. sc. (paratype, **IO 1774**).
Scale A (10 μ m; x 588), fig. 1; scale B (100 μ m; x 232), fig. 2; scale C (100 μ m; x 54), fig. 3; scale D (100 μ m; x 57), fig. 4; scale E (100 μ m; x 40), fig. 5; scale F (20 μ m; x 544), fig. 6.



ON *LOXOCONCHA ALATA* BRADY

by John Athersuch
(University of Leicester, England)

Loxoconcha alata Brady, 1868

- 1868 *Loxoconcha alata* sp. nov. G.S. Brady, *Ann. Mag. nat. Hist.* (4), 2, 223, pl. 14, figs. 8 - 13.
1971 *Loxoconcha xena* sp. nov. P.J. Barbeito-Gonzalez, *Mitt. hamb. zool. Mus. Inst.* 67, 308, pl. 33, figs. 1b, 2b.
1972 *Loxoconcha alata* Brady; H. Uffenorde, *Göttinger Arb. Geol. Paläont.* 13, 82, pl. 9, fig. 1.
1972 *Loxoconcha alata* Brady; W. Sissingh, *Utrecht Micropal. Bull.* 6, 132, pl. 10, fig. 13.

Lectotype: (here designated). Housed with the Brady collection, Hancock Museum, Newcastle-upon-Tyne; ♀ LV and RV (same specimen). No catalogue number, but placed in a separate, labelled slide.

Type locality: Tenedos (now called Bozcaada), W coast of Turkey, approx. lat. 39° 49'N, long. 26° 03'E; Recent.

Figured specimens: Hancock Museum specimens: Lectotype (♀ LV: Pl. 4, 100, fig. 1; ♀ RV: Pl. 4, 100, fig. 2). Brit. Mus. (Nat. Hist.) nos. 1975.1249 (♂ car.: Pl. 4, 102, fig. 1; Pl. 4, 104, fig. 1; Pl. 4, 106, figs. 3, 5), 1975.1250 (♂ LV: Pl. 4, 102, fig. 2; Pl. 4, 106, figs. 1, 2, 4), 1975.1251 (♀ car.: Pl. 4, 104, fig. 2), 1975.1252 (♂ appendages: Text-figs. 1a-c, 2a-c), 1975.1253 (♀ appendages: Text-fig. 1d).

Explanation of Plate 4, 100

Figs. 1, 2, ♀ car. (subsequently split) (lectotype, 565 µm long): fig. 1, LV, ext. lat.; fig. 2, RV, ext. lat.
Scale A (100 µm; x 162), figs. 1, 2.

Figured specimens: The lectotype and specimen 1975.1250, originally carapaces, were subsequently split into single valves.
(contd.) The lectotype was collected for Brady by T. Blain in 1868 from the type locality. 1975.1249 - 1253 were collected alive by J. Athersuch in Cyprus during 1973. 1975.1249 - 1251 were taken from shell sand collected at 40m off Kyrenia, approx. lat. 35° 21'N, long. 33° 22'E. 1975.1252, 1253 were associated with the sea-grass *Posidonia oceanica* in sand off Cape Greco, approx. lat. 34° 59'N, long. 34° 05'N, water temp. 22° C, depth 33m, salinity 39‰.

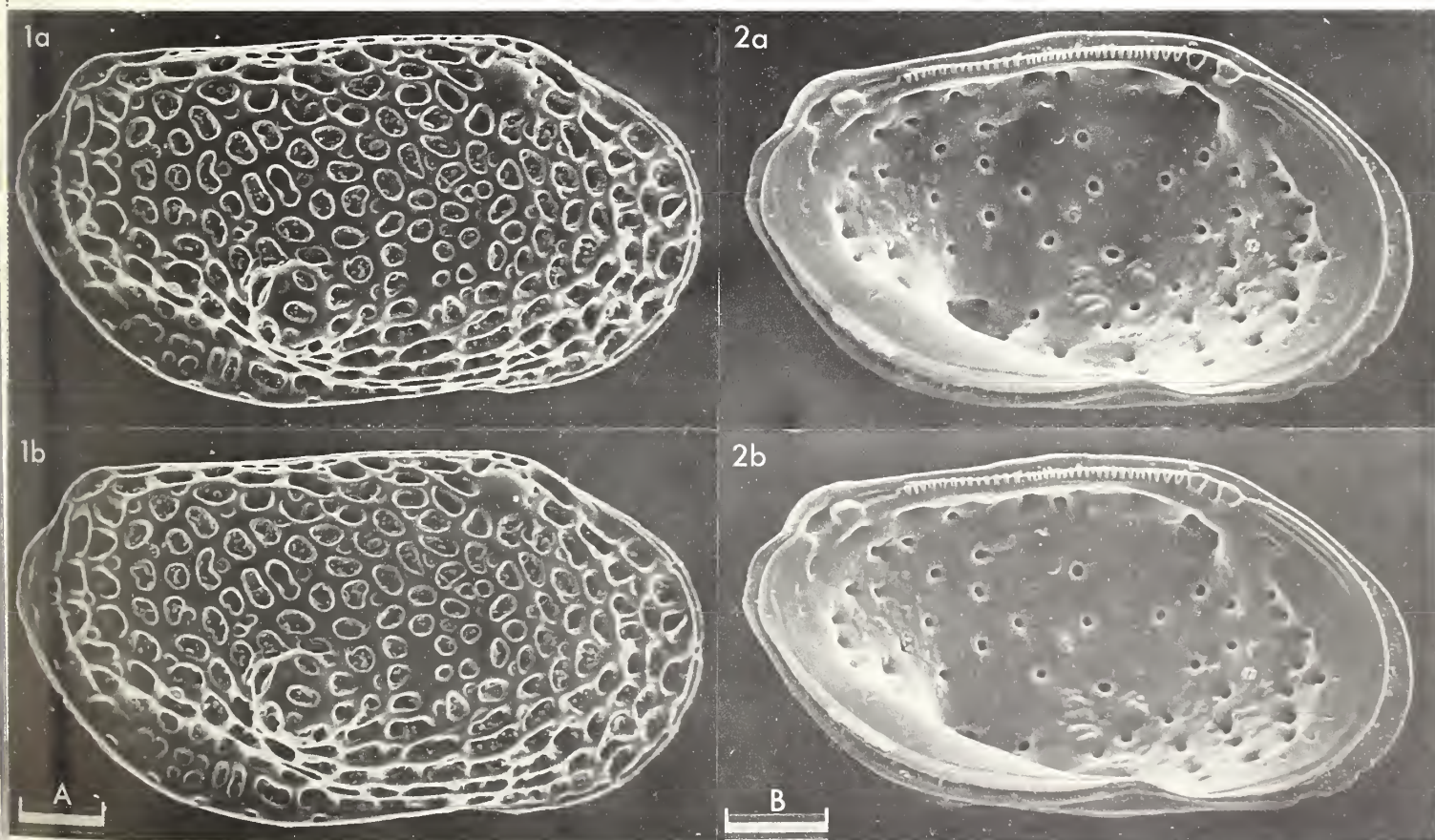
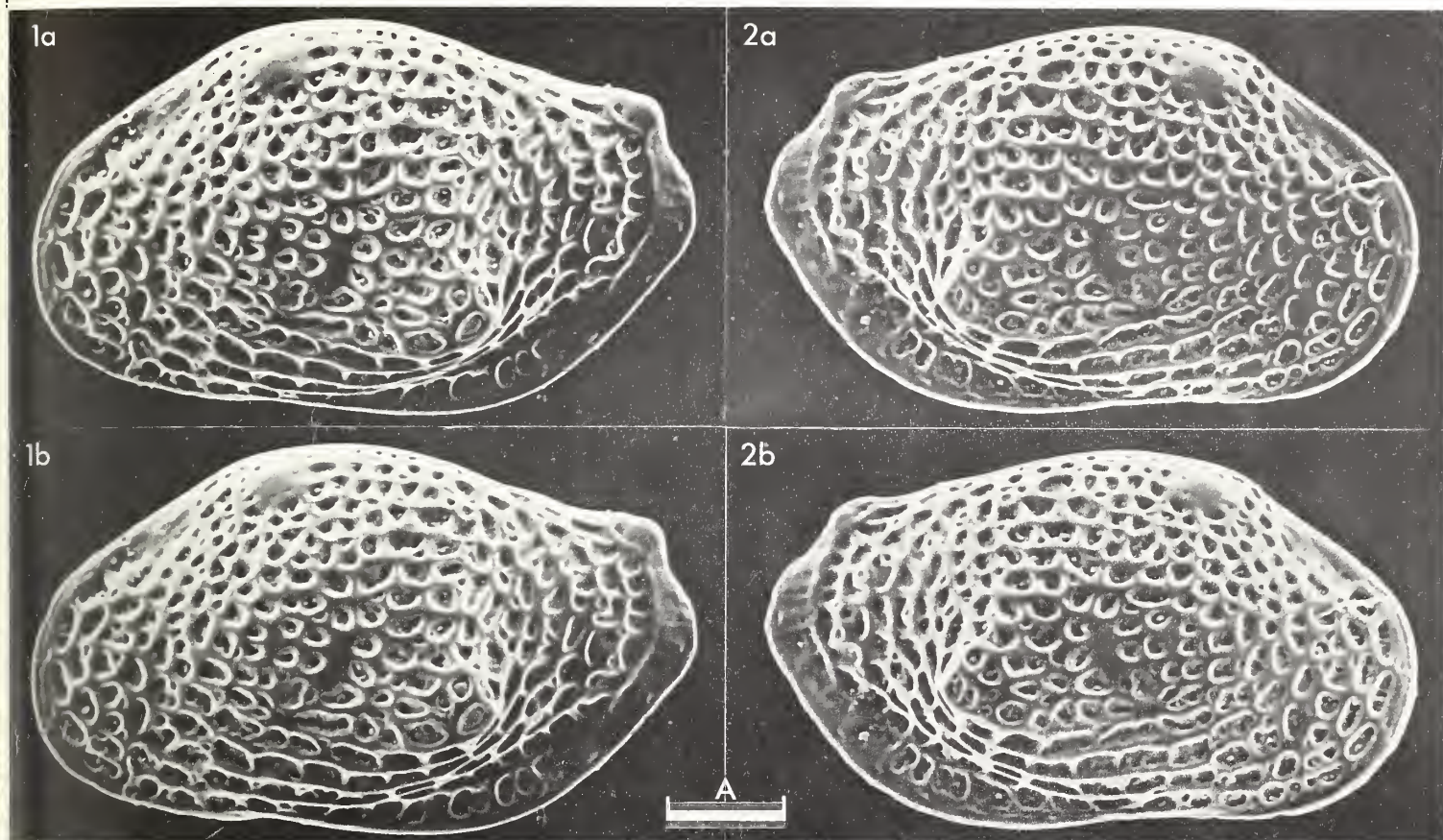
Diagnosis: Single, hollow, domed, ventromedian ala. Surface with subrounded fossae. Male copulatory appendages distinctive.

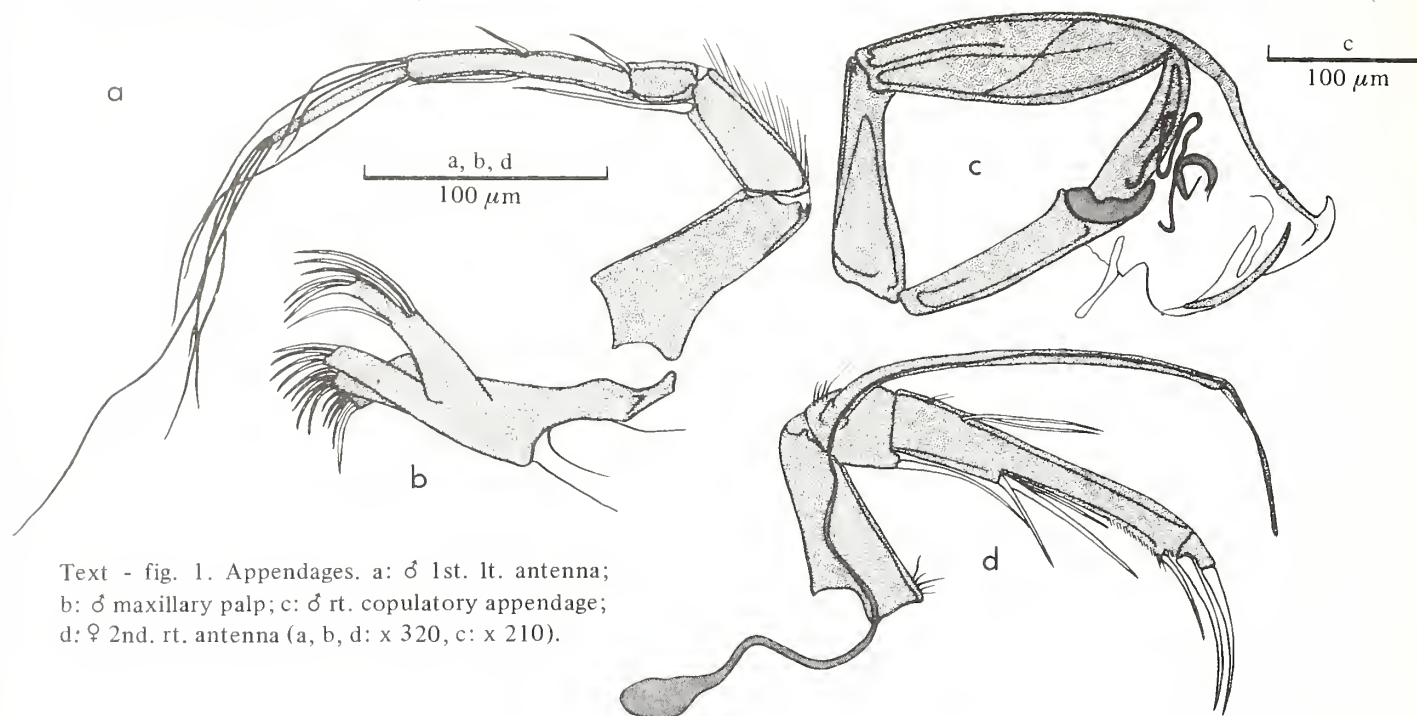
Remarks: The opportunity is taken to illustrate clearly this little known species and to show the appendages for the first time. The specimens in Brady's collection are smaller and have less pronounced alae than those from Cyprus.

Distribution: Recent from Tenedos (Bozcaada) (Brady, op. cit.), N Adriatic (Uffenorde, op. cit.), Cyprus (herein) and as *L. xena* sp. nov. from the Aegean (Barbeito-Gonzalez, op. cit.). Pleistocene and Pliocene from the Aegean (Sissingh, op. cit.).

Explanation of Plate 4, 102

Fig. 1, ♂ RV, ext. lat. (1975.1249, 720 µm long); fig. 2, ♀ LV, int. lat. (1975.1250, 646 µm long).
Scale A (100 µm; x 133), fig. 1; scale B (100 µm; x 142), fig. 2.

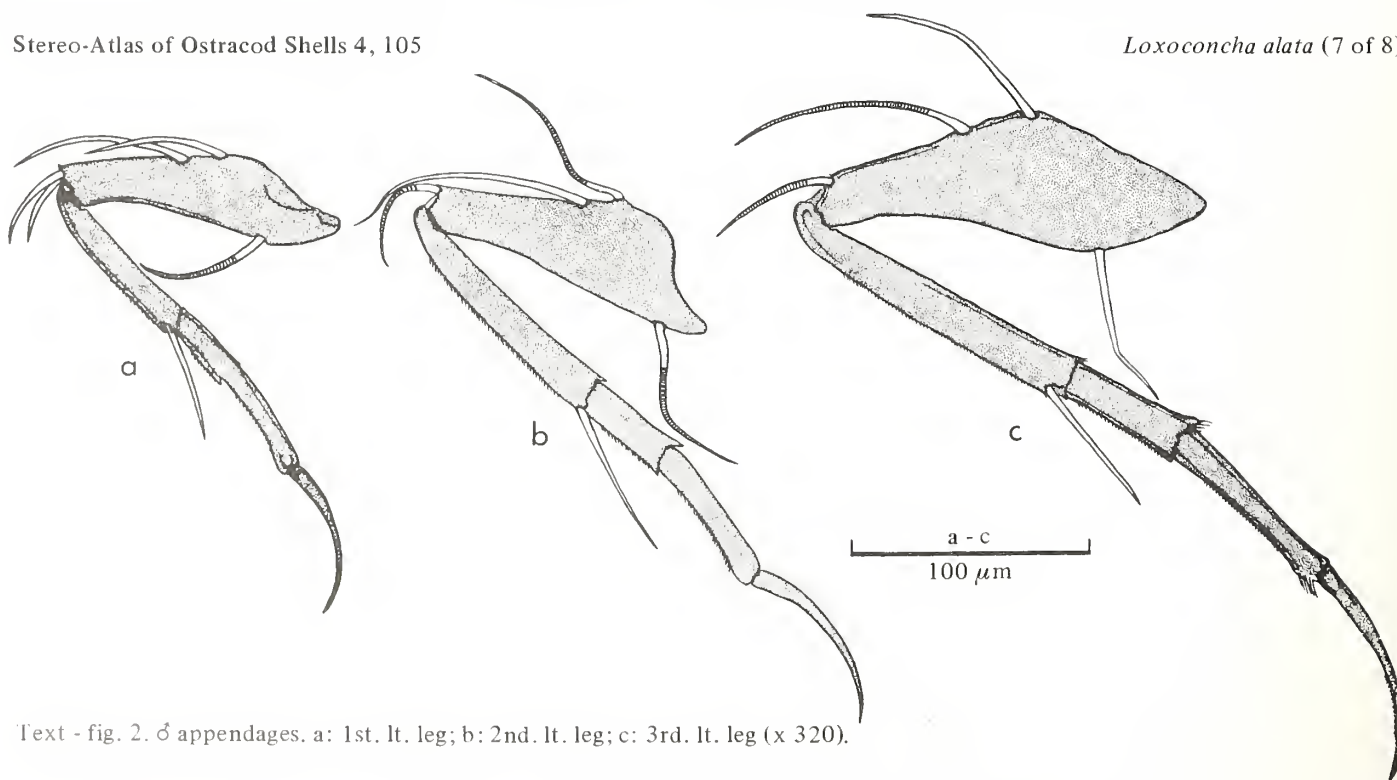




Text - fig. 1. Appendages. a: ♂ 1st. lt. antenna;
b: ♂ maxillary palp; c: ♂ rt. copulatory appendage;
d: ♀ 2nd. rt. antenna (a, b, d: x 320, c: x 210).

Explanation of Plate 4, 104

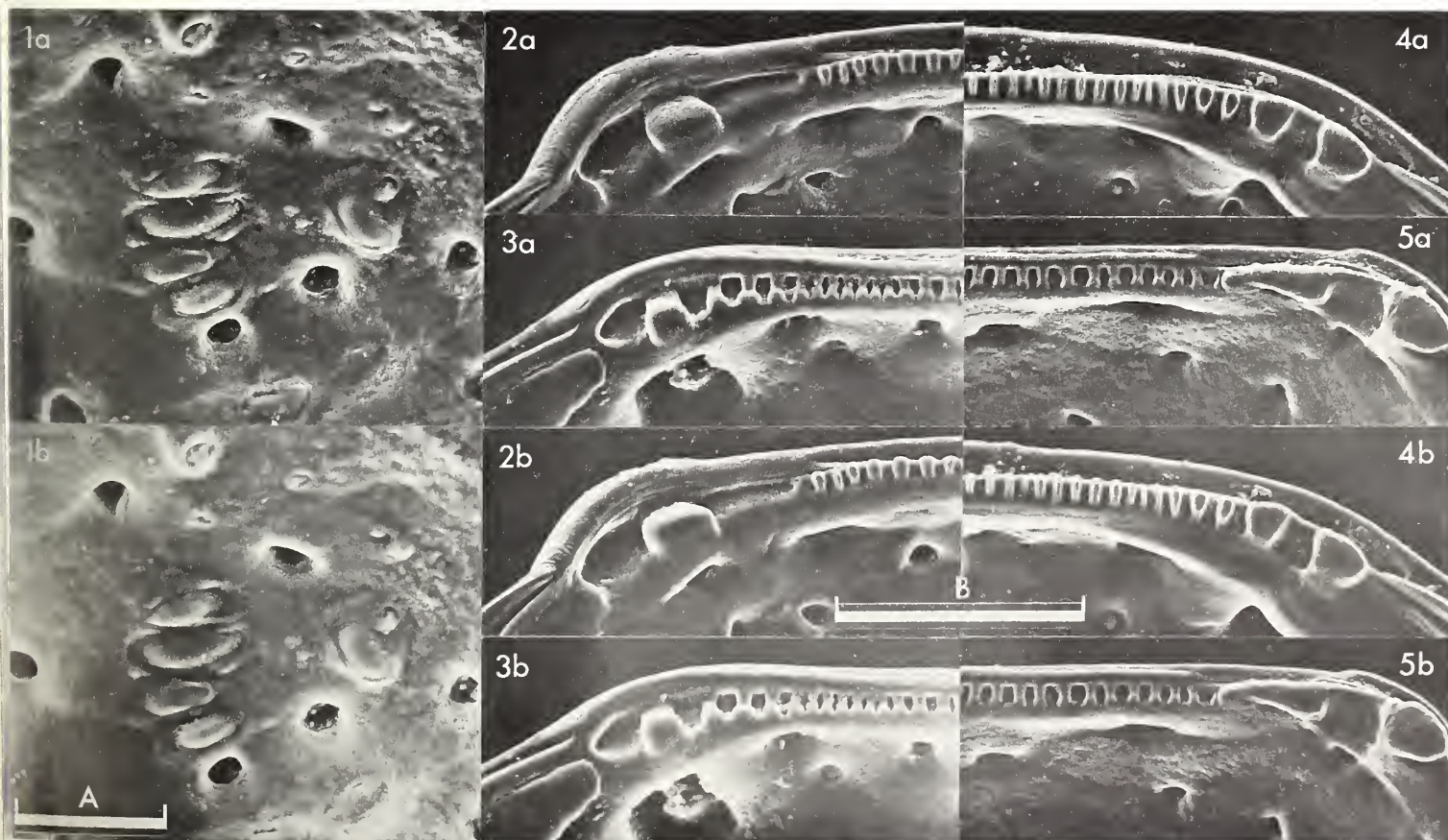
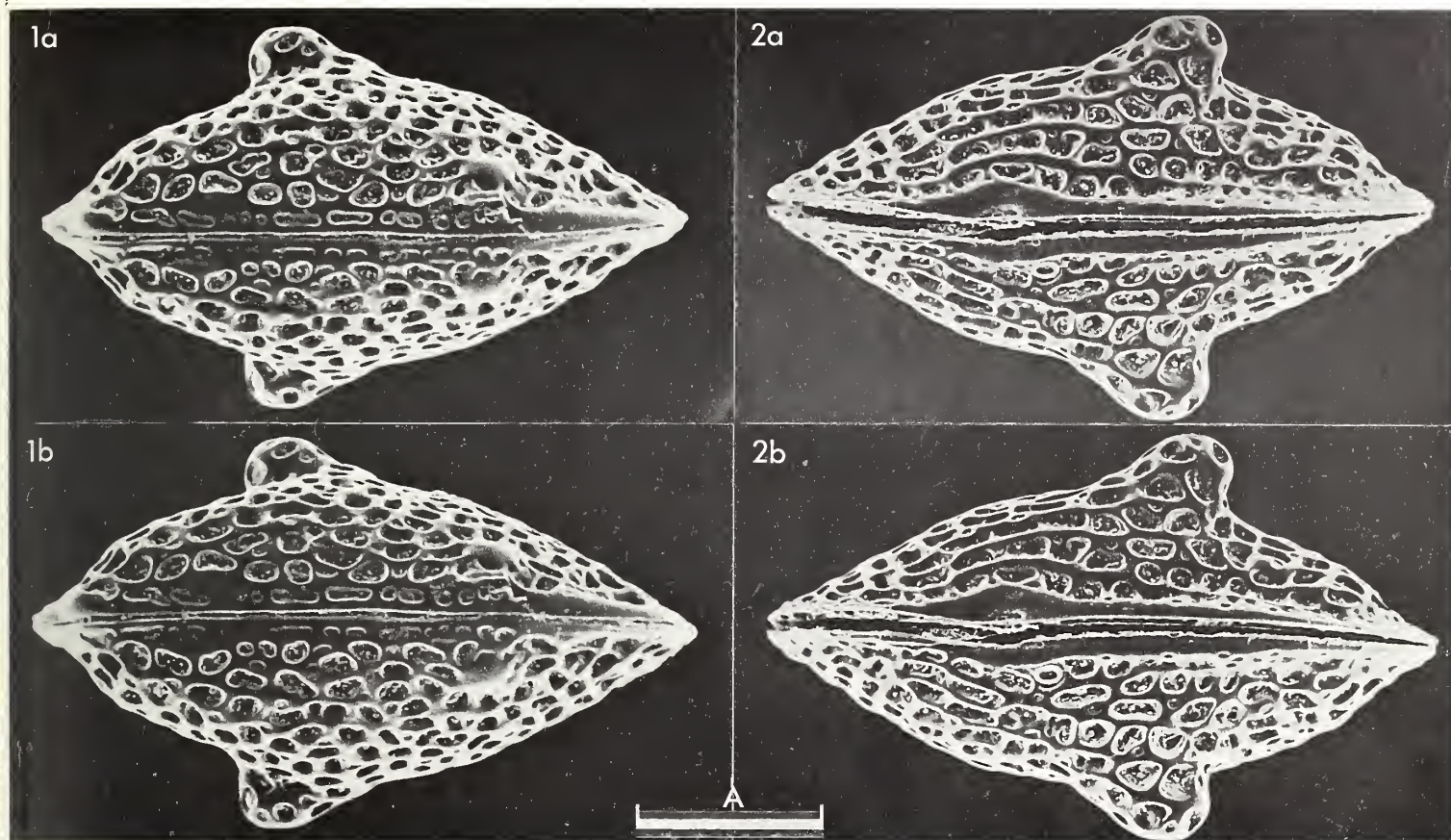
Fig. 1, ♂ car., dors. (1975.1249, 720 μm long); fig. 2, ♀ car., vent. (1975.1251, 720 μm long).
Scale A (200 μm; x 125), figs. 1, 2.



Text - fig. 2. ♂ appendages. a: 1st. lt. leg; b: 2nd. lt. leg; c: 3rd. lt. leg (x 320).

Explanation of Plate 4, 106

Fig. 1, ♀ LV, musc. sc. (1975.1250); figs. 2, 4, ♀ LV, int. lat. (1975.1250): fig. 2, post. hinge; fig. 4, ant. hinge. Figs. 3, 5, ♂ RV, int. lat. (1975.1249): fig. 3, ant. hinge; fig. 5, post. hinge.
Scale A (50 μm; x 447), fig. 1; scale B (100 μm; x 340), figs. 2 - 5.



ON *LOXOCONCHA STELLIFERA* G. W. MÜLLER

by John Athersuch
(University of Leicester, England)

Loxoconcha stellifera G. W. Müller, 1894

- 1894 *Loxoconcha stellifera* sp. nov. G.W.Müller, *Fauna Flora Golf. Neapel*, 21 343, pl. 27, figs. 8, 15; pl. 28, figs. 2, 7.
1964 *Loxoconcha stellifera* Müller; R.Lerner-Seggev, *Israel J.Zool* 13, 157, pl. 11, figs. 84 - 89, pl. 12, figs. 90 - 95.

Type specimens: A thorough examination, by the present author, of Müller's syntype collection, whilst on loan to the Stazione Zoologica di Napoli, Italy, failed to reveal any specimens of *L. stellifera*. Therefore, the type must be presumed lost.

Type locality: Bay of Naples, Italy, approx. lat. 40° 45'N, long. 14° 15'E; Recent.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. 1976.743 (♂ LV: Pl. 4, 108, fig. 1), 1976.744 (♂ LV: Pl. 4, 108, fig. 2), 1976.745 (♀ RV: Pl. 4, 108, fig. 3), 1976.746 (♂ car.: Pl. 4, 110, fig. 1), 1976.747 (♀ car.: Pl. 4, 110, fig. 2), 1976.748 (♀ car.: Pl. 4, 110, fig. 3), 1976.749 (♂ RV: Pl. 4, 112, fig. 1; Pl. 4, 114, figs. 1, 2, 4), 1976.751 (♀ LV: Pl. 4, 112, fig. 2; Pl. 4, 114, figs. 3, 5), 1976.750 (♂ RV & soft parts: Pl. 4, 112, fig. 3).
Text-figs. 1a-d, 2a-d based on 1976.743.

Explanation of Plate 4, 108

Fig. 1, ♂ LV, ext. lat. (1976.743, 732 µm long); fig. 2, ♂ LV, ext. lat. (1976.744, 707 µm long); fig. 3, ♀ RV, ext. lat. (1976.745, 646 µm long).

Scale A (250 µm; x 88), figs. 1 - 3.

Figured specimens: 1976.744 - 751 were collected by J. Athersuch during autumn 1973 off the coasts of Cyprus. 1976.744 (contd.) was alive on filamentous algae, Petra tou Romiou, approx. lat. 34° 40'N, long. 32° 37'E, depth 1m, water temp. 25.5° C. salinity 39‰. 1976.751 was living amongst fine encrusting algae, Kyrenia, approx. lat. 32° 19'N, long. 35° 20'E, depth 2m, salinity 39‰. 1976.745 - 50 were taken from 0 - 15m in sand at other localities. 1976.743, from Tunisia, was collected alive by Dr. G. Bonaduce.

Diagnosis: Shape of both sexes similar to *Loxoconcha rhomboidea* (Fischer), but carapace, particularly of female more tumid. Shell surface with puncta and small pits. Male copulatory appendages distinctive.

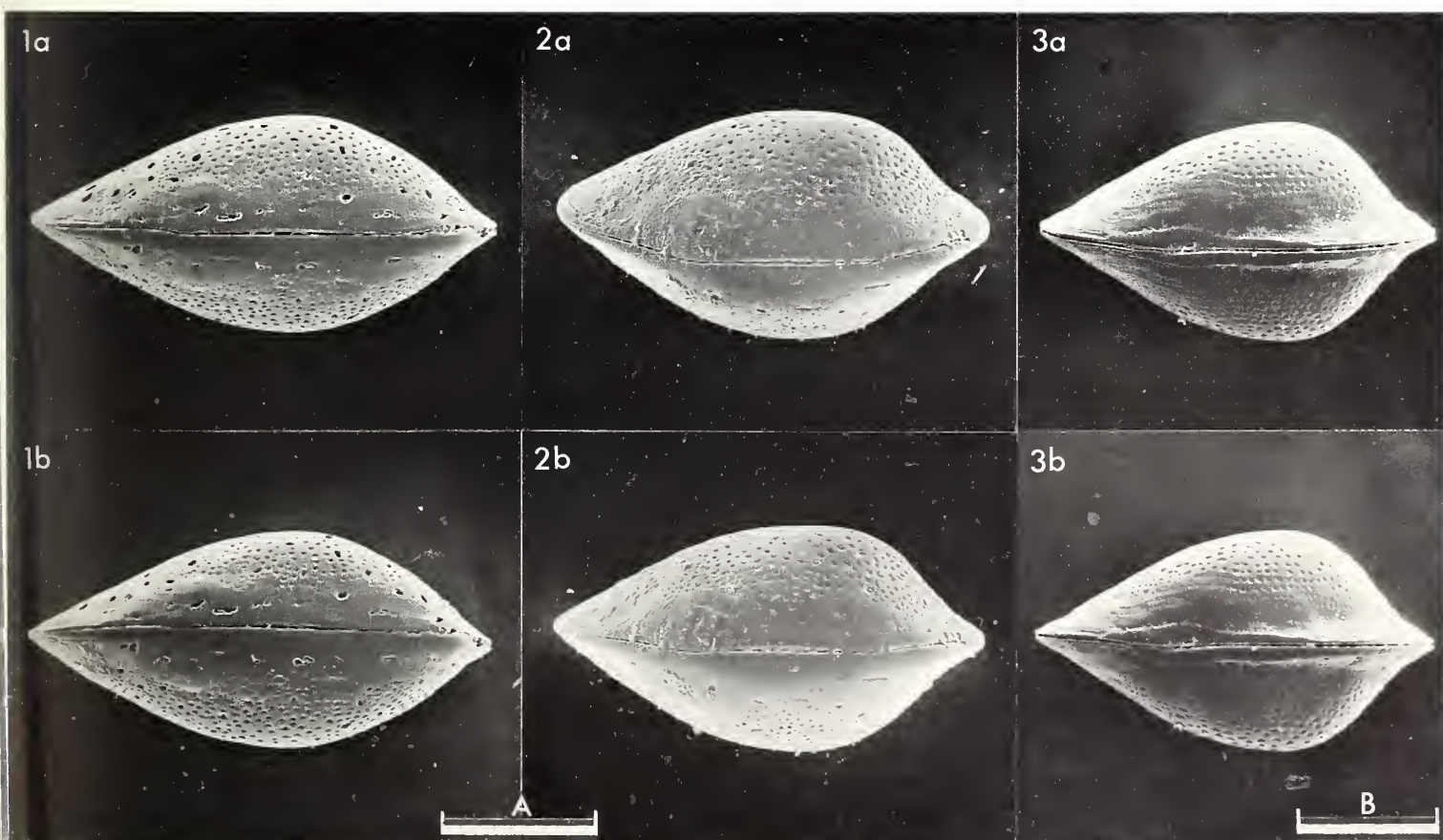
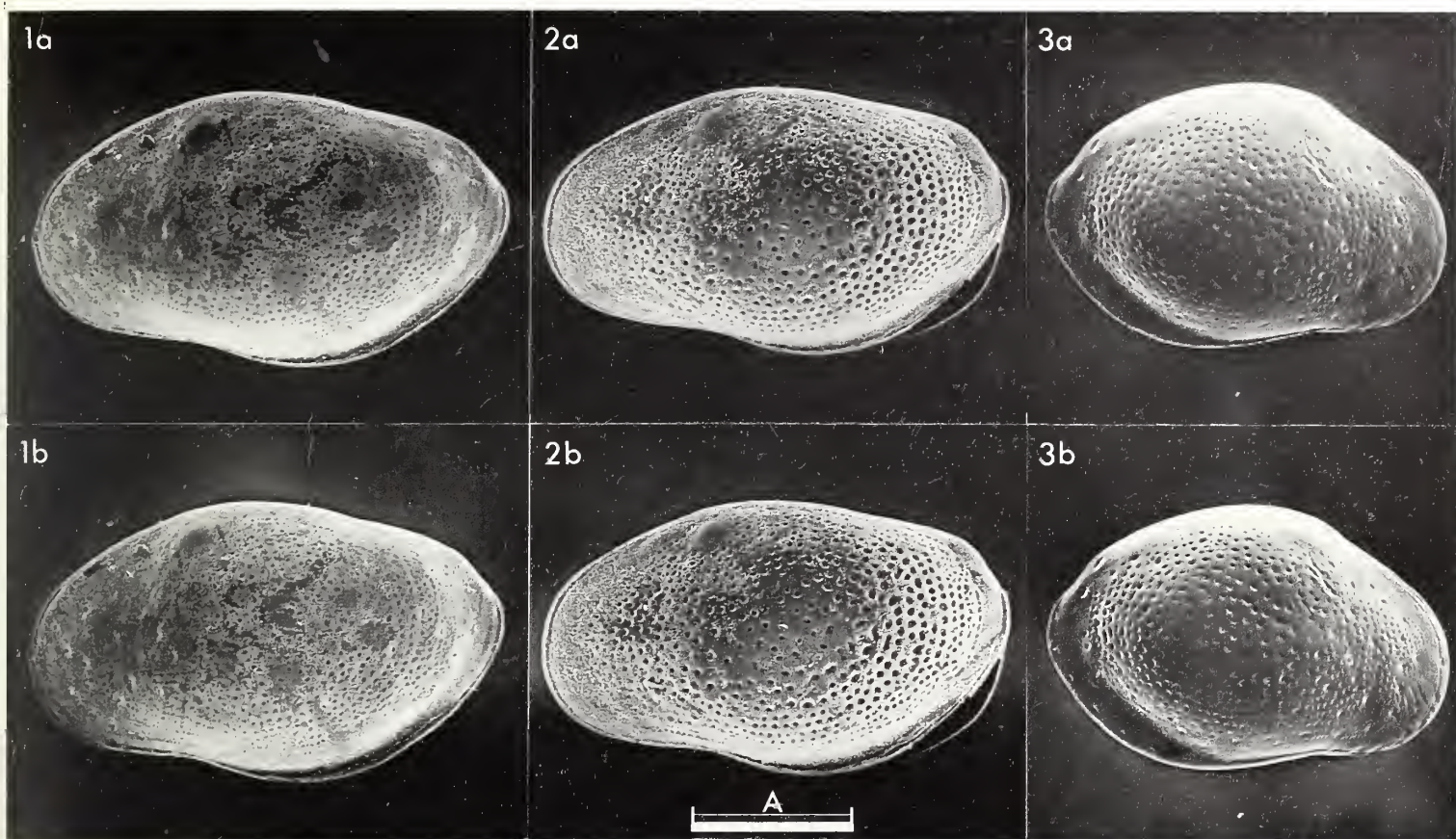
Remarks: Müller's description and illustrations (Müller, op. cit.) adequately define this species. Therefore, no neotype need be designated. Müller's specimens were from shallow water amongst sand and seaweed. *Loxoconcha lata* Brady, 1868, was considered as a possible senior synonym, but the types are unknown and the original description and illustrations are considered so inadequate that the name *L. lata* is regarded as a *nomen dubium*.

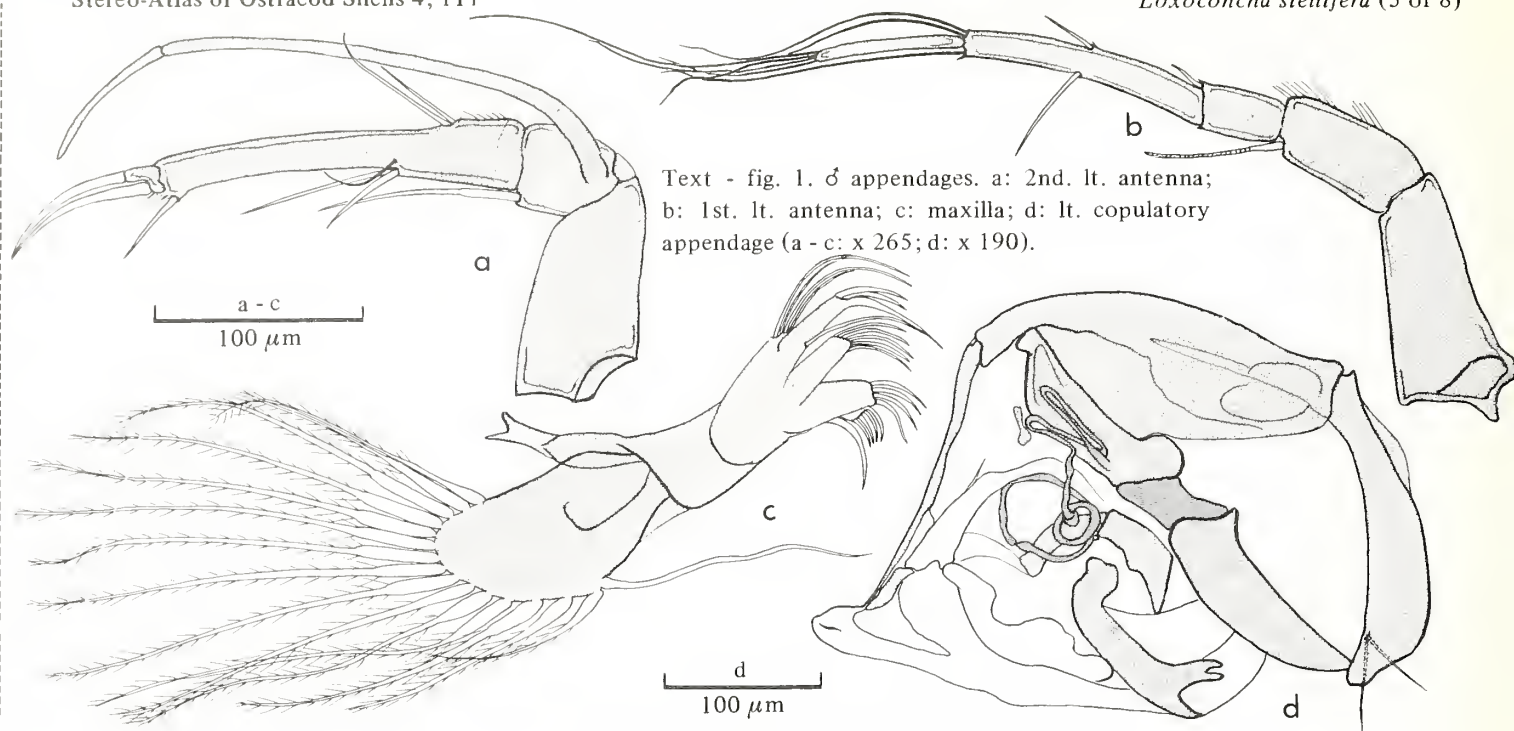
Distribution: The following records can be confirmed. Recent: Italy (Müller, op. cit.), Tunisia, Cyprus (herein), Israel (Lerner-Seggev, op. cit.).

Explanation of Plate 4, 110

Fig. 1, ♂ car., ext. dors. (1976.746, 715 µm long); fig. 2, ♀ car., ext. dors. (1976.747, 659 µm long); fig. 3, ♀ car., ext. vent. (1976.748, 682 µm long).

Scale A (250 µm; x 88), figs. 1, 2; scale B (250 µm; x 80), fig. 3.

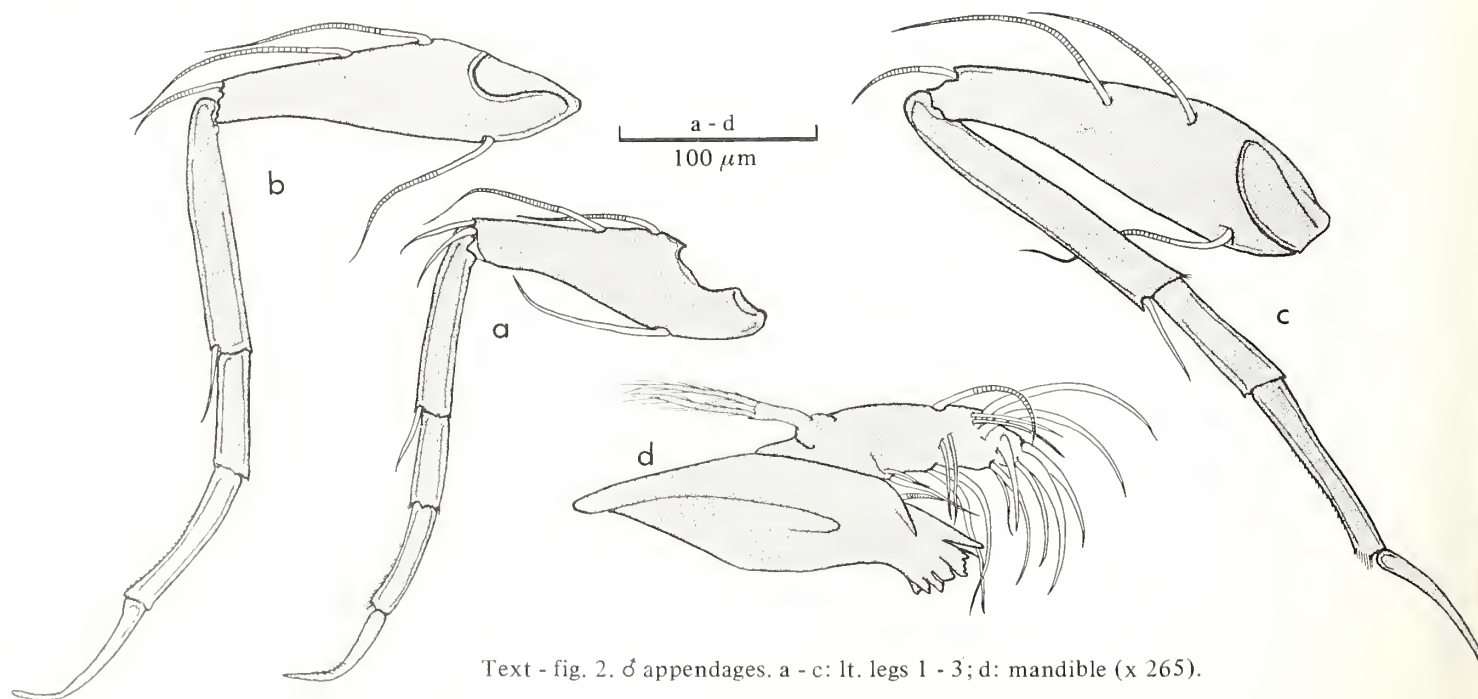




Text - fig. 1. ♂ appendages. a: 2nd. lt. antenna; b: 1st. lt. antenna; c: maxilla; d: lt. copulatory appendage (a - c: x 265; d: x 190).

Explanation of Plate 4, 112

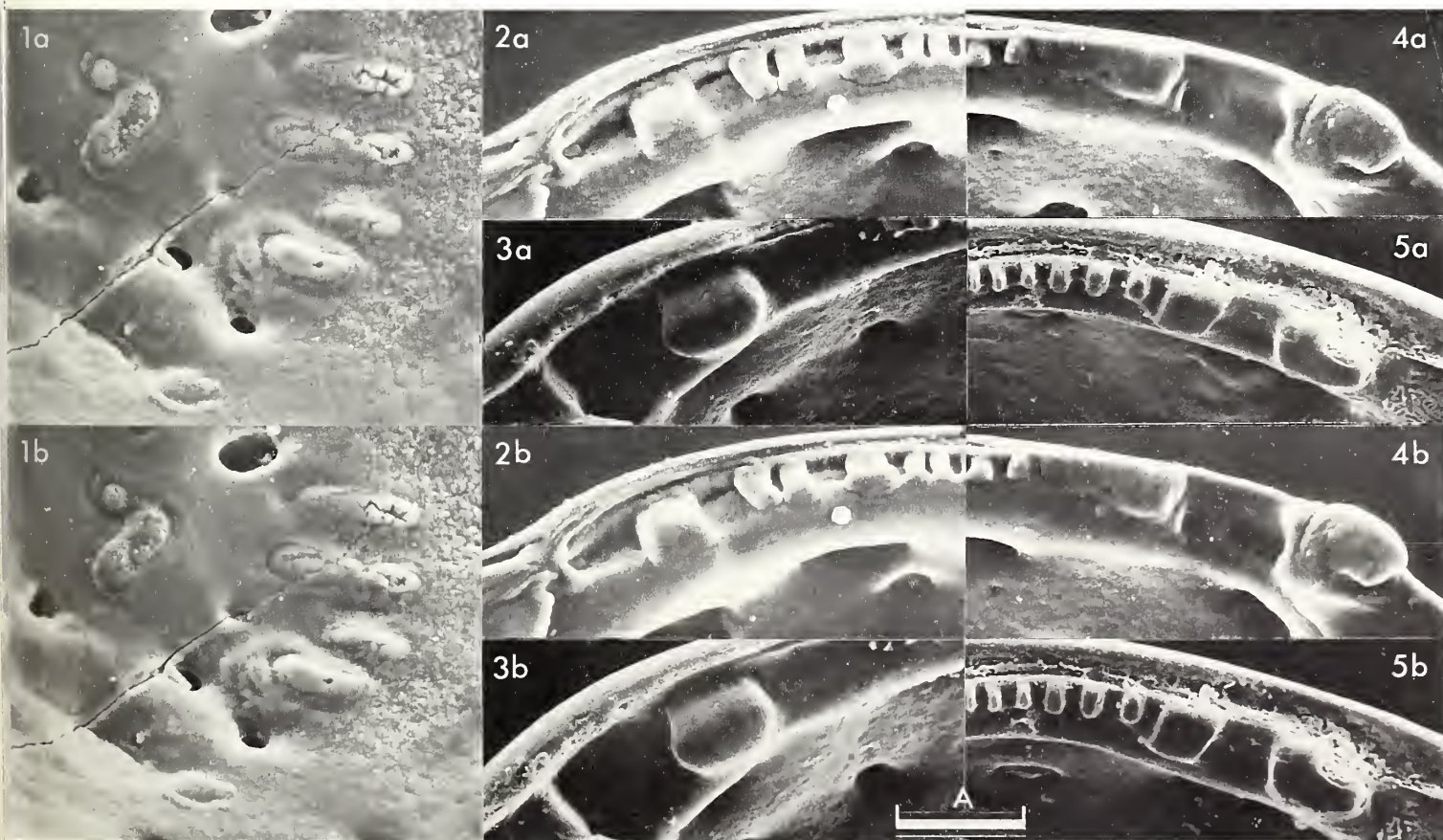
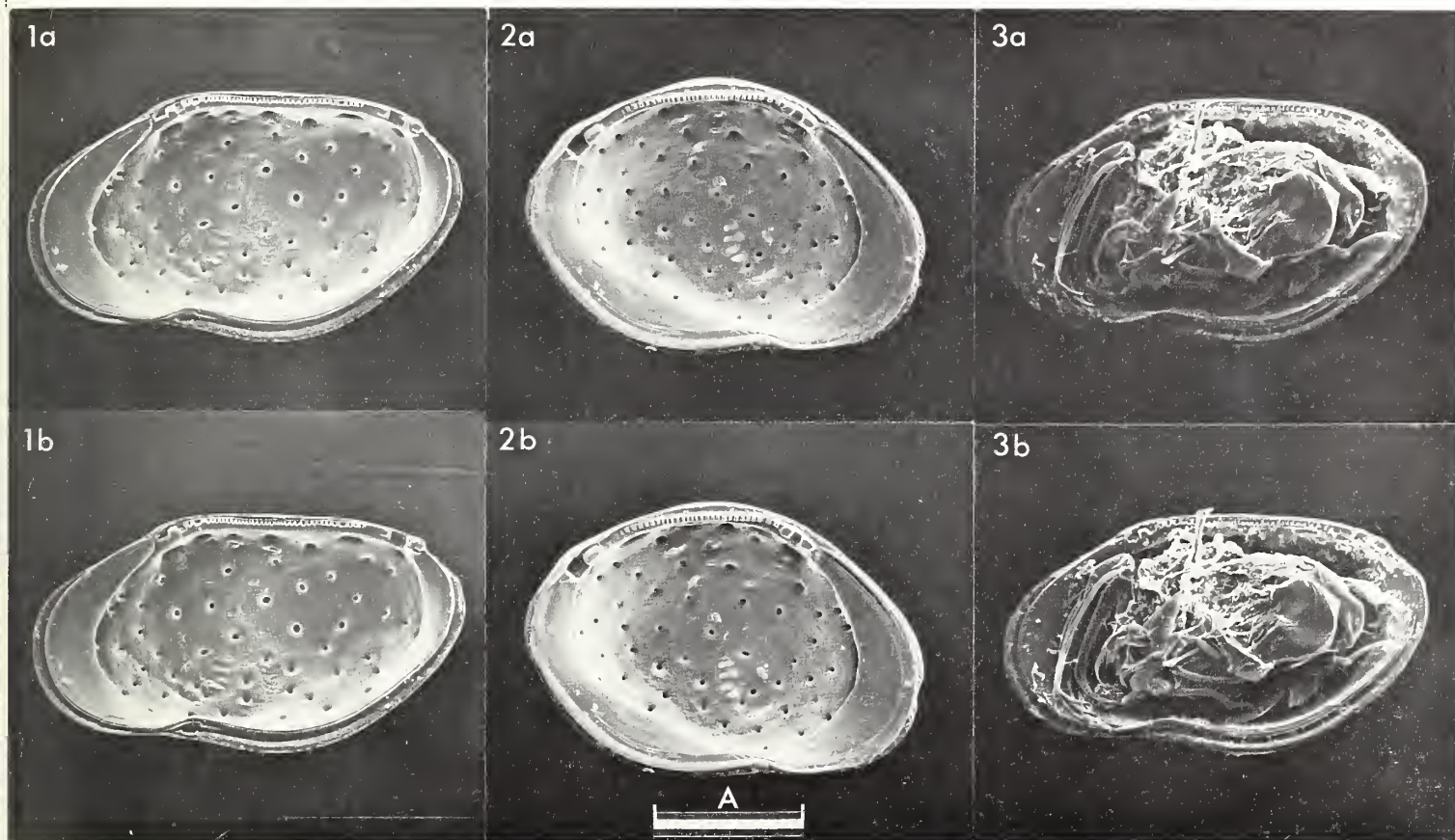
Fig. 1, ♂ RV, int. lat. (1976.749, 744 μm long); fig. 2, ♀ LV, int. lat. (1976.751, 646 μm long); fig. 3, ♂ RV, int. lat., showing soft parts (1976.750, 695 μm long)
Scale A (250 μm; x 83), figs. 1 - 3.



Text - fig. 2. ♂ appendages. a - c: lt. legs 1 - 3; d: mandible (x 265).

Explanation of Plate 4, 114

Fig. 1, ♂ RV, int. musc. sc. (1976.749); figs. 2, 4, ♂ RV, terminal hinge elements (1976.749); figs. 3, 5, ♀ LV, terminal hinge elements (1976.751).
Scale A (25 μm; x 550), figs. 1 - 5.



ON *LOXOCONCHA NEA* BARBEITO - GONZALEZ

by John Athersuch
(University of Leicester, England)

Loxoconcha nea Barbeito-Gonzalez, 1971

1971 *Loxoconcha nea* sp. nov. P.J. Barbeito-Gonzalez, *Mitt. hamb. zool. Mus. Inst.* 67, 308, pl. 33, figs. 1c, 2c, 3c, 4c, 5c.

Lectotype: (designated herein). Hamburg Zoological Museum no. **K 30443** from the Barbeito-Gonzalez collection (ex-slide 196, **K 29261**): ♂ car., subsequently split into separate valves.

Type locality: Naxos, Greece, approx. lat. 37° 00'N, long. 25° 30'E; Recent.

Figured specimens: Hamburg Zoological Museum nos. **K 30443** (ex-slide 196, **K 29261**) (♂ car.: Pl. 4, 118, fig. 2), **K 30441** (♂ car.: LV: Pl. 4, 116, fig. 1, Pl. 4, 118, figs. 5, 7; RV: Pl. 4, 116, fig. 2), **K 30442** (♀ RV: Pl. 4, 116, fig. 3; Pl. 4, 118, figs. 1, 3, 4, 6). All specimens were collected by P.J. Barbeito-Gonzalez from the type locality.

Explanation of Plate 4, 116

Fig. 1, ♂ LV, ext. lat. (**K 30441**, 659 µm long); fig. 2, ♂ RV, ext. lat. (**K 30441**, 659 µm long); fig. 3, ♀ RV, ext. lat. (**K 30442**, 549 µm long).

Scale A (250 µm; x 90), figs. 1 - 3.

Diagnosis: Shell surface reticulate. Soli often in groups of 4 - 6 within primary reticulum. Prominent, rimmed sieve pores with apophyses.

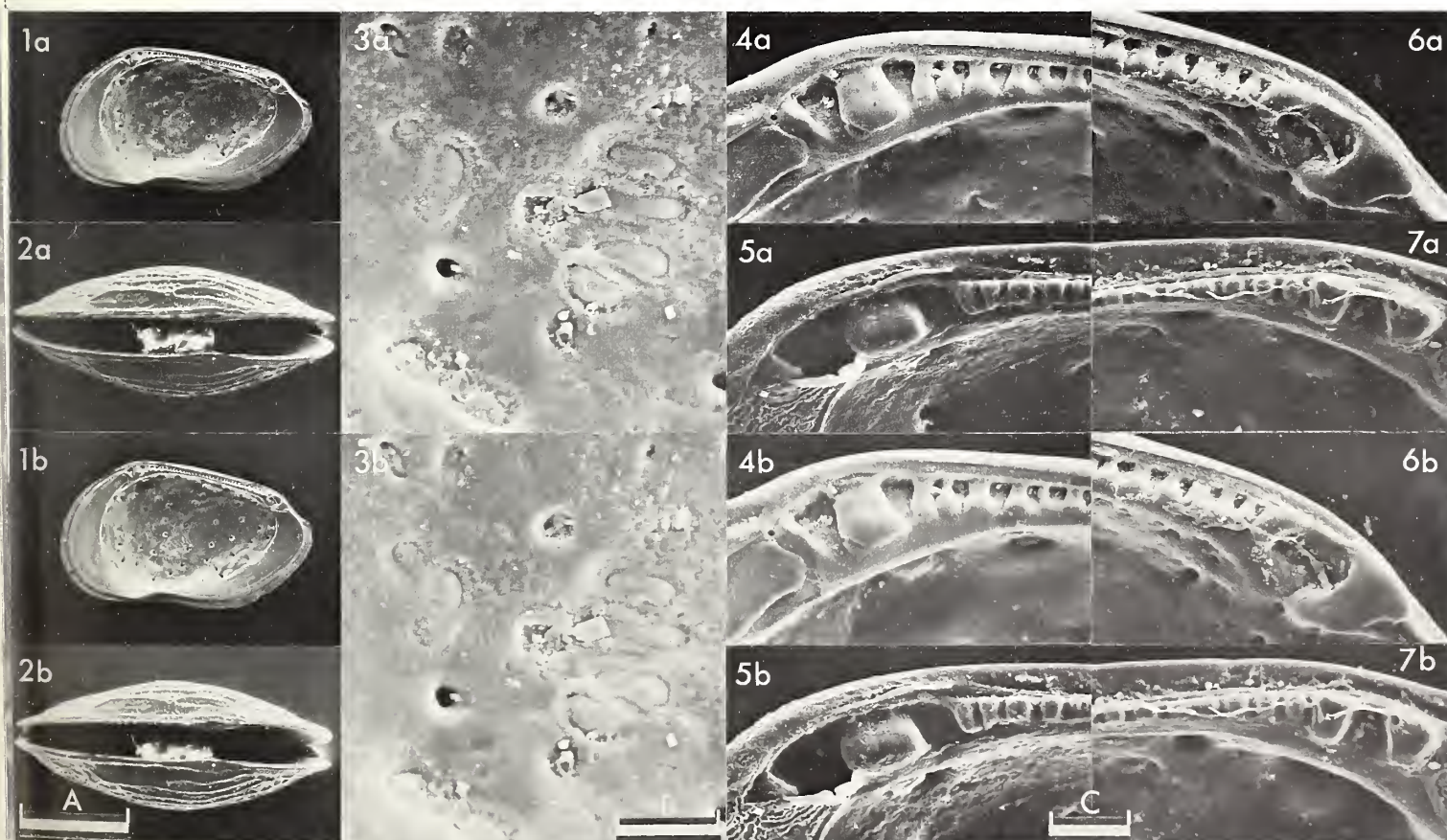
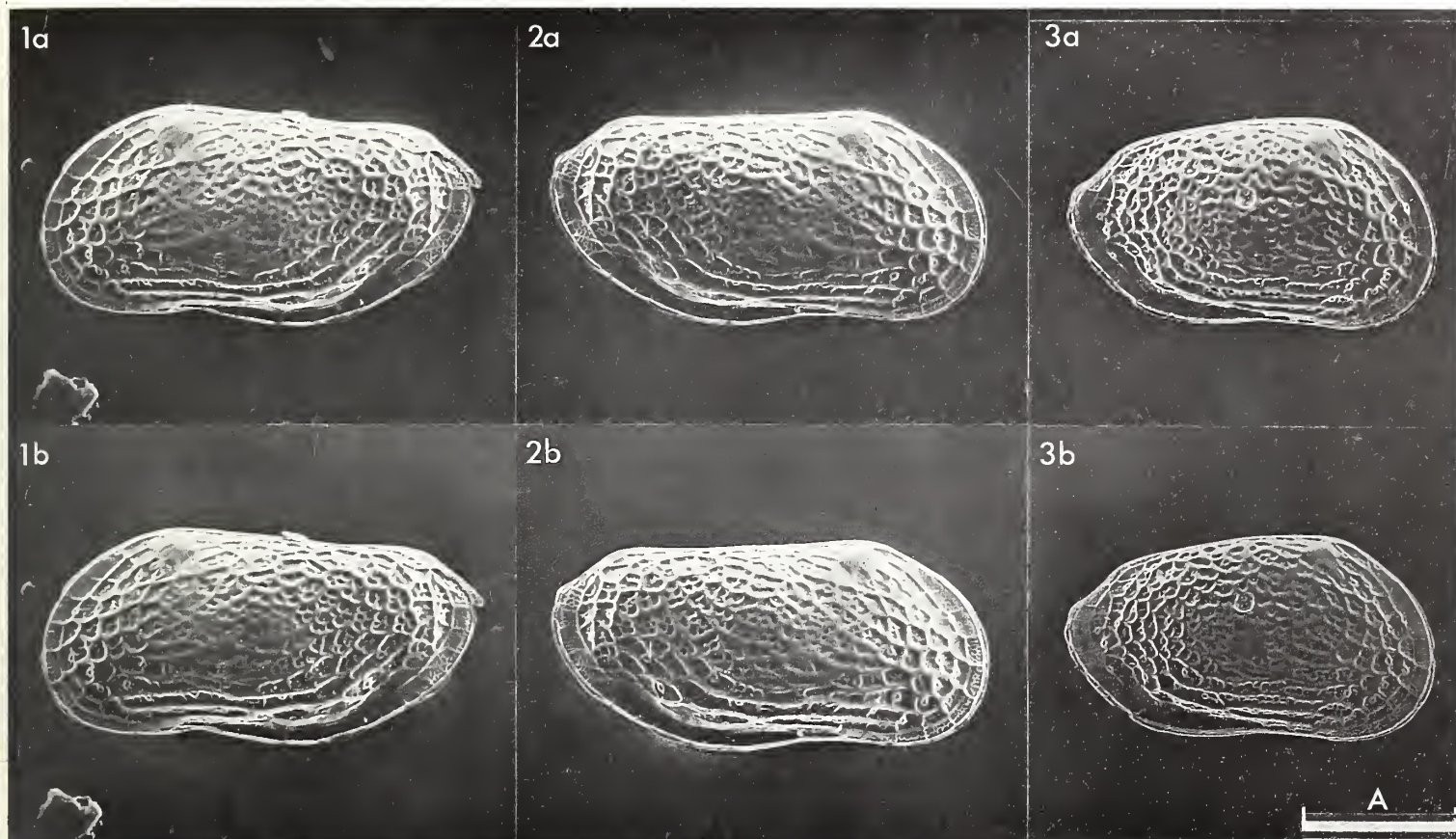
Remarks: The lectotype was chosen from slide no. 196 in the Barbeito-Gonzalez collection, labelled 'Holotypen' and containing both dimorphs of *L. nea*. This species closely resembles *L. conjugalis* Athersuch sp. nov. (see *Stereo-Atlas of Ostracod Shells* 4, 119 - 126) but lacks proboli and recessi characteristic of the latter species. Males more elongate than females. Soft parts unknown.

Distribution: Known only from the type locality. Found at 0 - 4m, water temp. 30 - 35°C, salinity 25 - 40‰.

Explanation of Plate 4, 118

Fig. 1, ♀ RV, int. lat. (**K 30442**, 549 µm long); fig. 2, ♂ car., ext. vent. (valves gaping) (lectotype, **K 30443**, 707 µm long); fig. 3, ♂ RV, int. musc. sc. (**K 30442**); figs. 4, 6, ♀ RV, terminal hinge elements (**K 30442**); figs. 5, 7, ♂ LV, terminal hinge elements (**K 30441**).

Scale A (250 µm; x 64), figs. 1, 2; scale B (25 µm; x 575), fig. 3; scale C (25 µm; x 440), figs. 4 - 7.



ON *LOXOCONCHA CONJUGALIS* ATHERSUCH sp. nov.

by John Athersuch
(University of Leicester, England)

Loxoconcha conjugalis sp. nov.*Holotype*: Brit. Mus. (Nat. Hist.) no. 1976.731; ♂ car. and soft parts.*Type locality*: Cape Greco, Cyprus, approx. lat. 34° 58'N, long. 34° 03'E; Recent.*Derivation of name*: Latin, 'pertaining to marriage'. Suggested by the possible copulatory function of external features of the valves.

Figured specimens: British Museum (Nat. Hist.) nos. 1976.719 (♂ LV: Pl. 4, 120, fig. 1), 1976.720 (♀ RV: Pl. 4, 120, fig. 2), 1976.721 (♀ LV: Pl. 4, 120, fig. 3; Pl. 4, 126, fig. 2), 1976.722 (♂ LV: Pl. 4, 122, fig. 1; Pl. 4, 126, fig. 3), 1976.723 (♂ RV: Pl. 4, 122, fig. 2; Pl. 4, 124, figs. 5, 7), 1976.724 (♀ RV: Pl. 4, 126, fig. 1), 1976.725 (♂ car.: Pl. 4, 124, fig. 1), 1976.726 (♂ car.: Pl. 4, 124, fig. 2), 1976.727 (♂ car.: Pl. 4, 124, fig. 3), 1976.728 (♀ car.: Pl. 4, 124, fig. 4), 1976.729 (♂ LV: Pl. 4, 124, figs. 6, 8), 1976.730 (♀ RV: Pl. 4, 122, fig. 3), 1976.731 (♂ appendages: Text-figs. la-d, 2a-d).

All the specimens are from the coasts of Cyprus; nos. 1976.720 - 724, 726 - 729, 731 collected by J. Athersuch during autumn 1973. The holotype (1976.731), from Chapel Bay, approx. lat. 34° 58'N, long. 34° 03'E, contained well-preserved soft parts (Text-figs. la-d, 2a-d); found on filamentous algae at 0.5m, water temp. 23.5°C, salinity 39‰, O₂ 105%. 1976.724, 726, which contained remnants of soft parts, came from the same locality. 1976.720 - 723, 727 - 729 are from beach sand, Gastria, approx. lat.

Explanation of Plate 4, 120

Fig. 1, ♂ LV, ext. lat. (1976.719, 683 µm long); fig. 2, ♀ RV, ext. lat. (1976.720, 524 µm long); fig. 3, ♀ LV, ext. lat. (1976.721, 524 µm long).

Scale A (250 µm; x 90), figs. 1 - 3.

Figured specimens: 34° 19'N, long. 33° 59'E. 1976.719, 725, 730 collected from sand during 1968 by Squ. Ldr. C.R. Chrisp. (contd.) 1976.719 from Khrysokhou Bay, approx. lat. 35° 06'N, long. 32° 19'E, and 1976.725, 730 from Klidhes Island, approx. lat. 35° 42'N, long. 34° 36'E.

Diagnosis: A species of *Loxoconcha* with male recessi and female proboli.

Remarks: The new term *recessus* is proposed for the posteroventral sinus of the male (Latin, recess; plural, *recessi*) and the new term *probolus* is proposed for each of the corresponding prominences of the female (Greek, prominence; plural, *proboli*).

This species is very similar to *Loxoconcha nea* Barbeito-Gonzalez (see *Stereo-Atlas of Ostracod Shells* 4, 115 - 118). *L. nea*, however, lacks both recessi and proboli. The development of the proboli is variable; in some specimens there is a single swelling (Pl. 4, 126, fig. 1), in others several distinct nodes are present (Pl. 4, 120, figs. 2, 3). Some specimens possess an exceptionally strong ornament (Pl. 4, 124, fig. 2; Pl. 4, 126, fig. 1).

Although no members of this species have been observed copulating, the copulatory position is assumed to be posteroventral/posteroventral, as with some other members of this genus (e.g. *L. elliptica* Brady, pers. comm. Dr. J.E. Whittaker). In this position, with gaping valves, the proboli could be inserted into the recessi during copulation. This device would provide a more rigid union and possibly bring the soft parts of the mating pair closer together. This is the first recorded occurrence of pronounced copulatory adaption of the carapace in *Loxoconcha*.

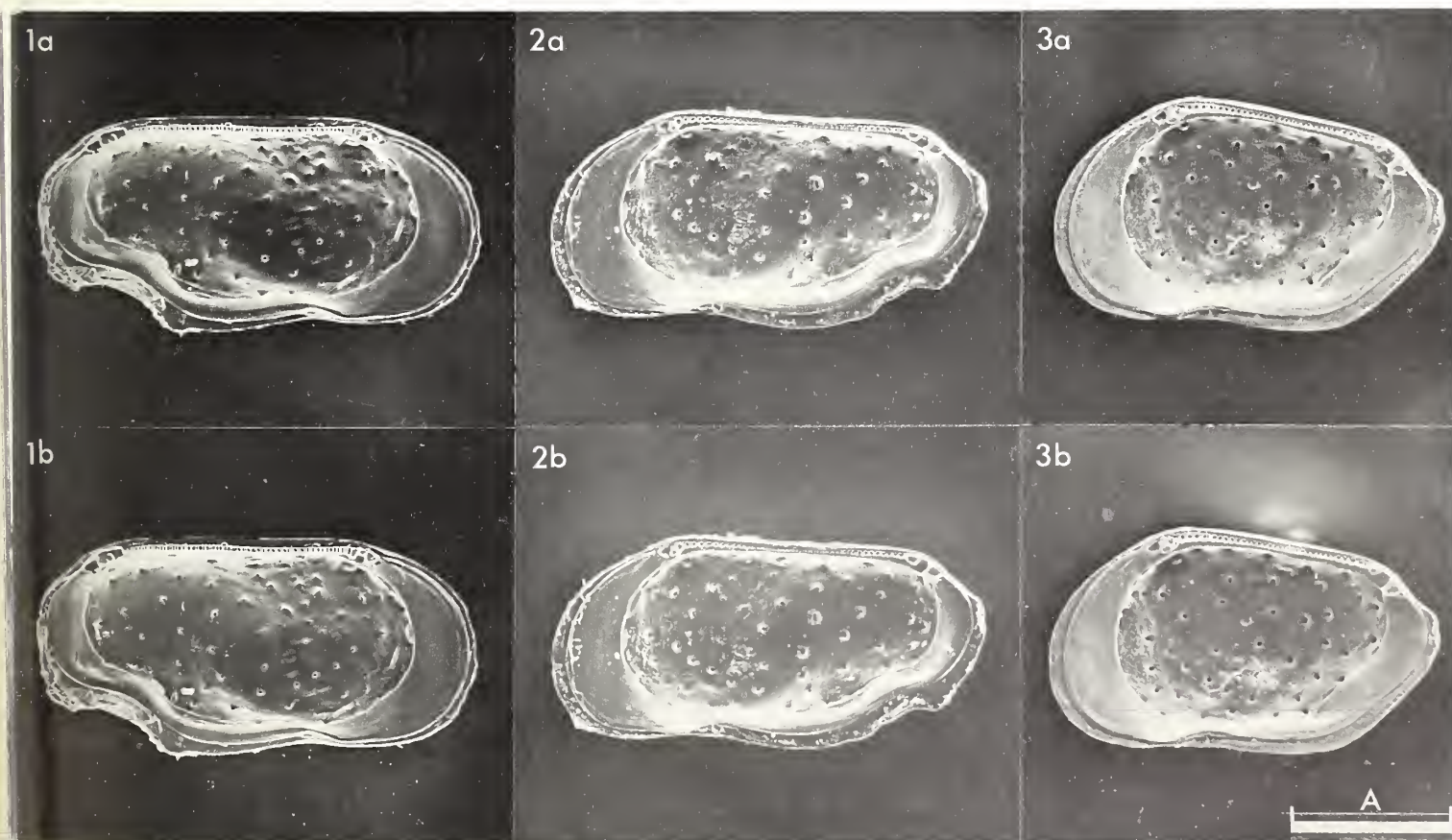
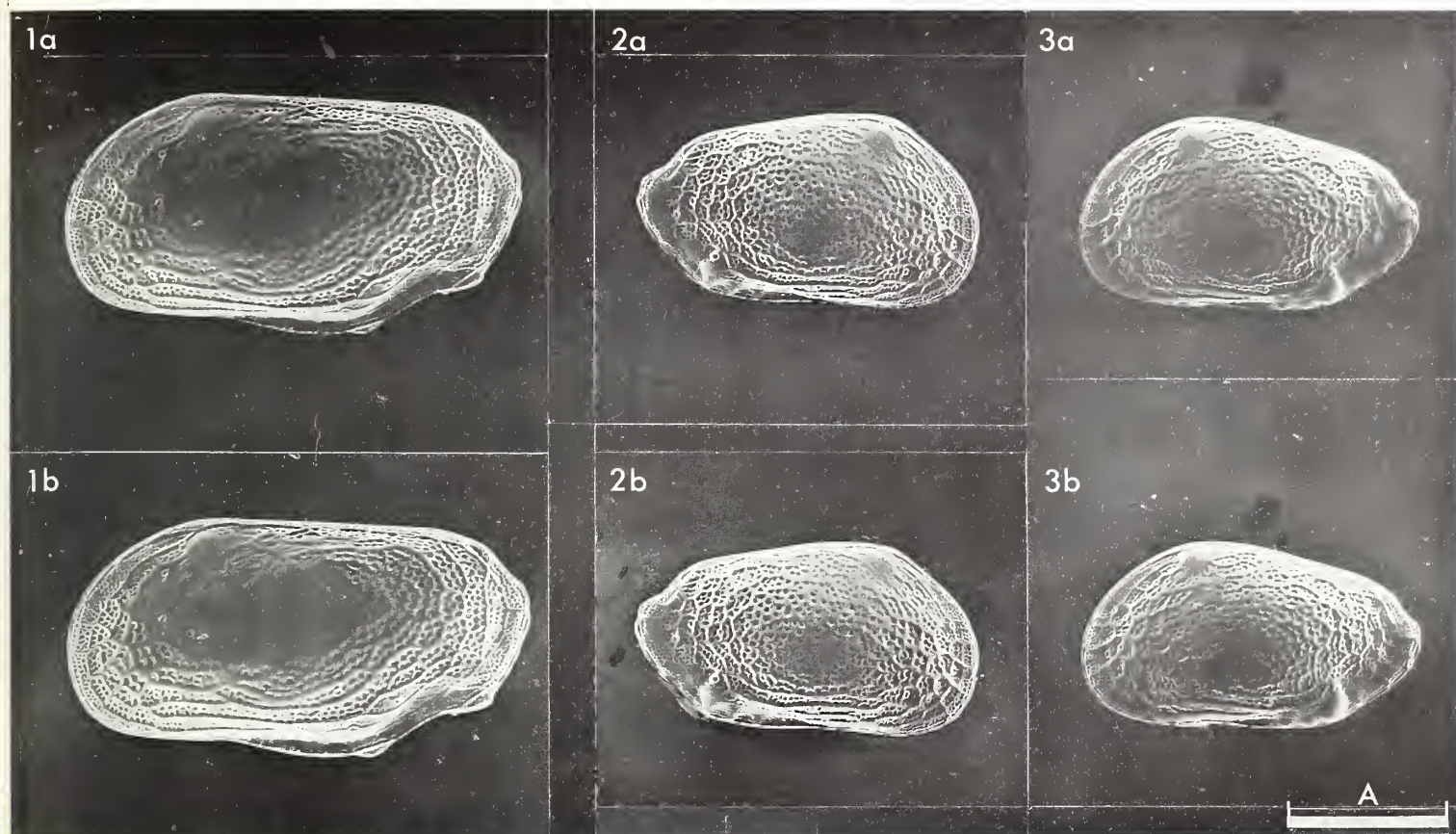
Male copulatory appendages similar to those of *L. rhomboidea* (Fischer), but are more elongate and differ in their detailed organisation. Females shorter and proportionately higher than males.

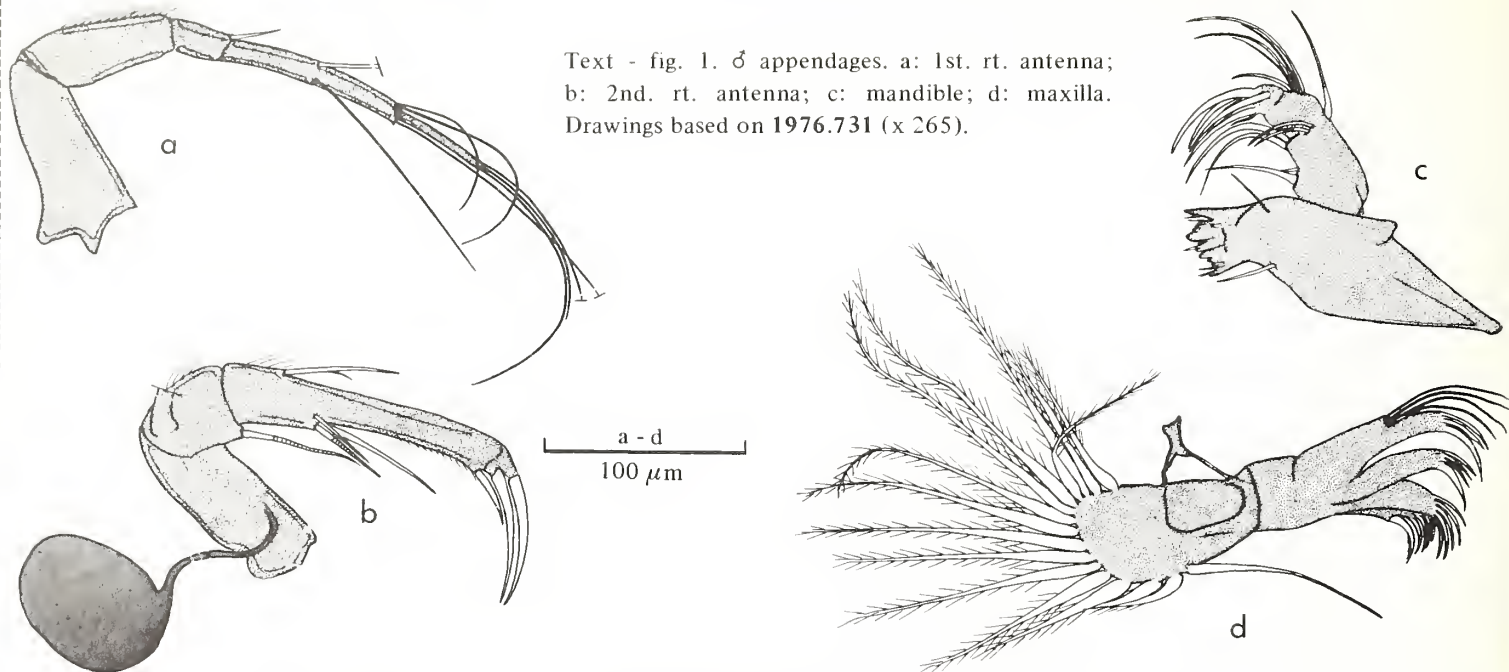
Distribution: Recent; known only from Cyprus where specimens have been found alive, associated with algae in shallow water.

Explanation of Plate 4, 122

Fig. 1, ♂ LV, int. lat. (1976.722, 659 µm long); fig. 2, ♂ RV, int. lat. (1976.723, 671 µm long); fig. 3, ♀ RV, int. lat. (1976.730, 598 µm long).

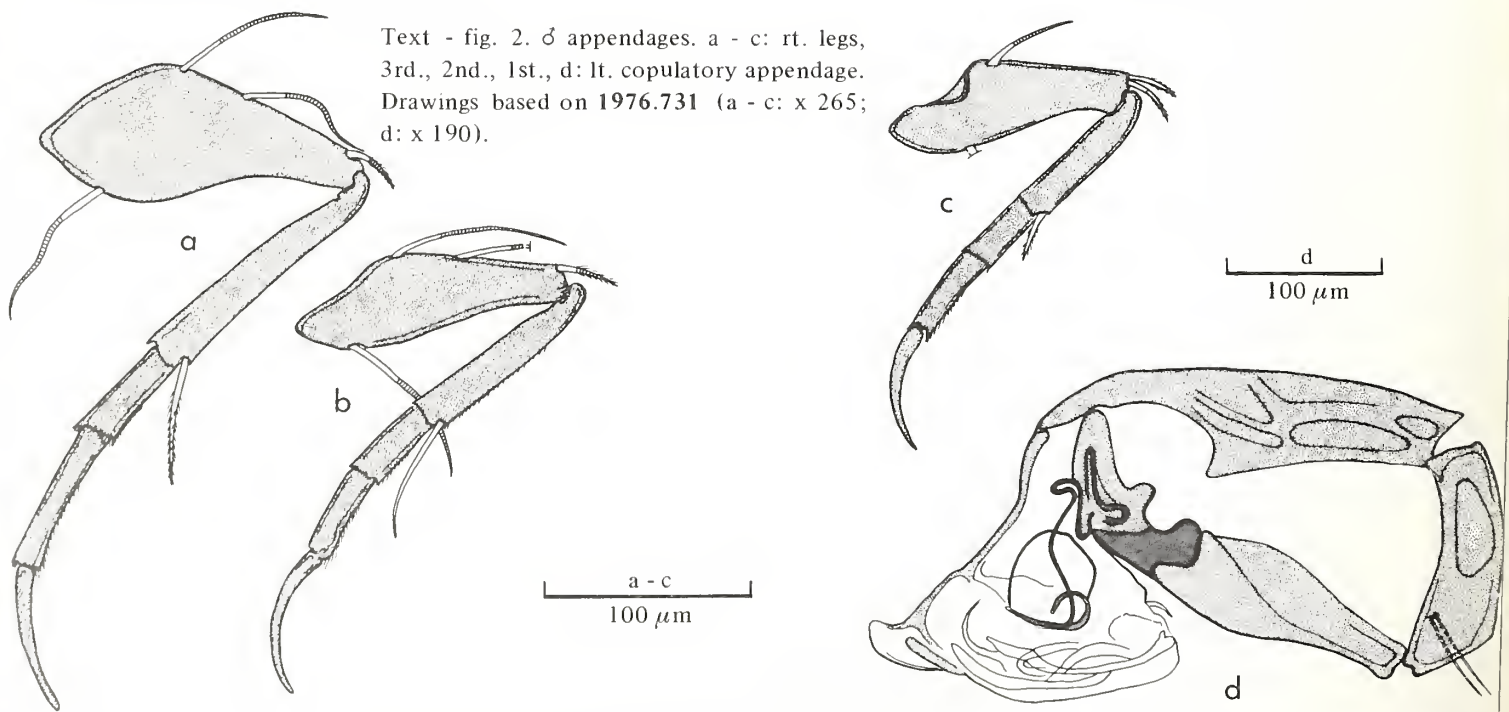
Scale A (250 µm; x 90), figs. 1 - 3.





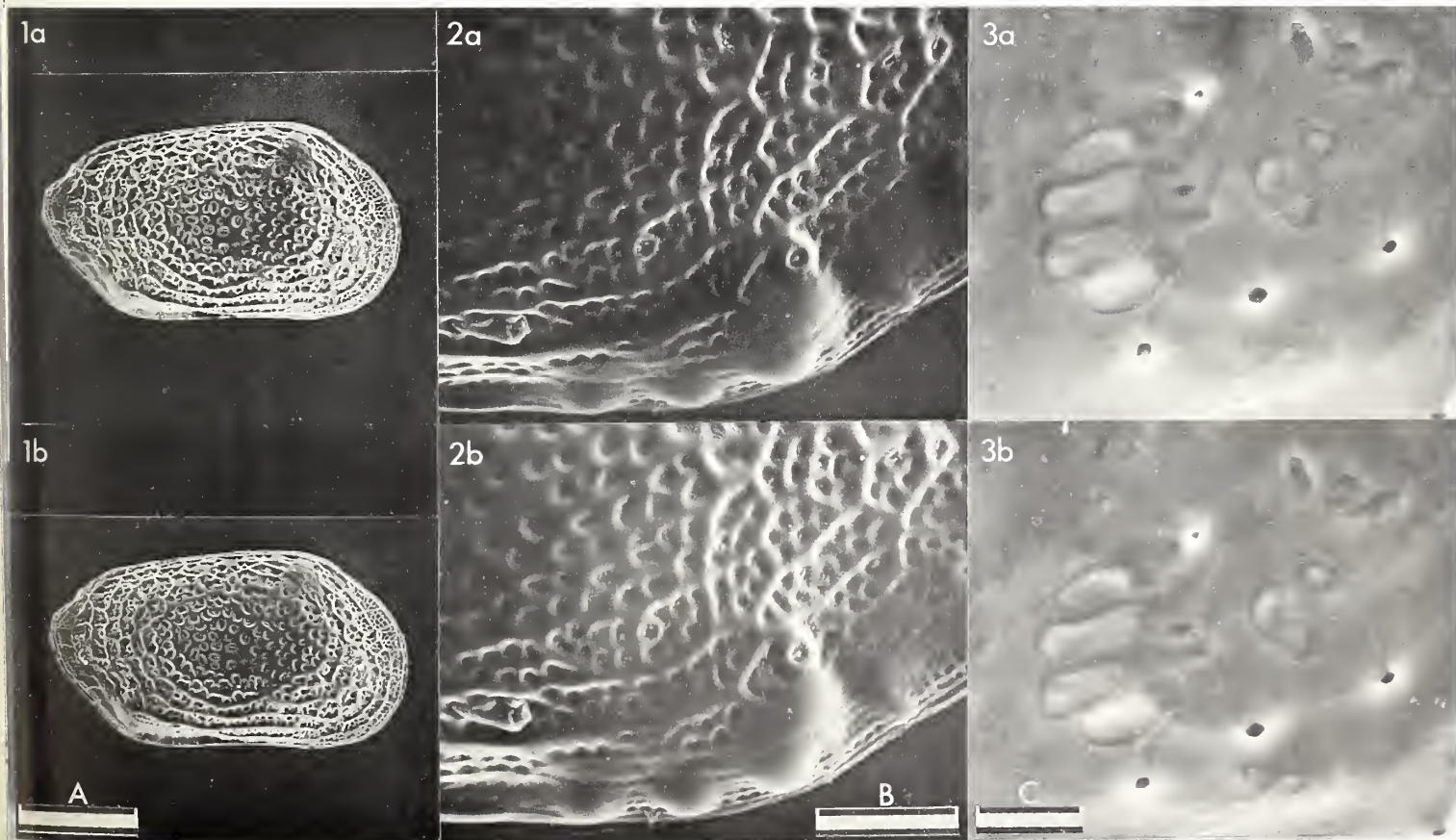
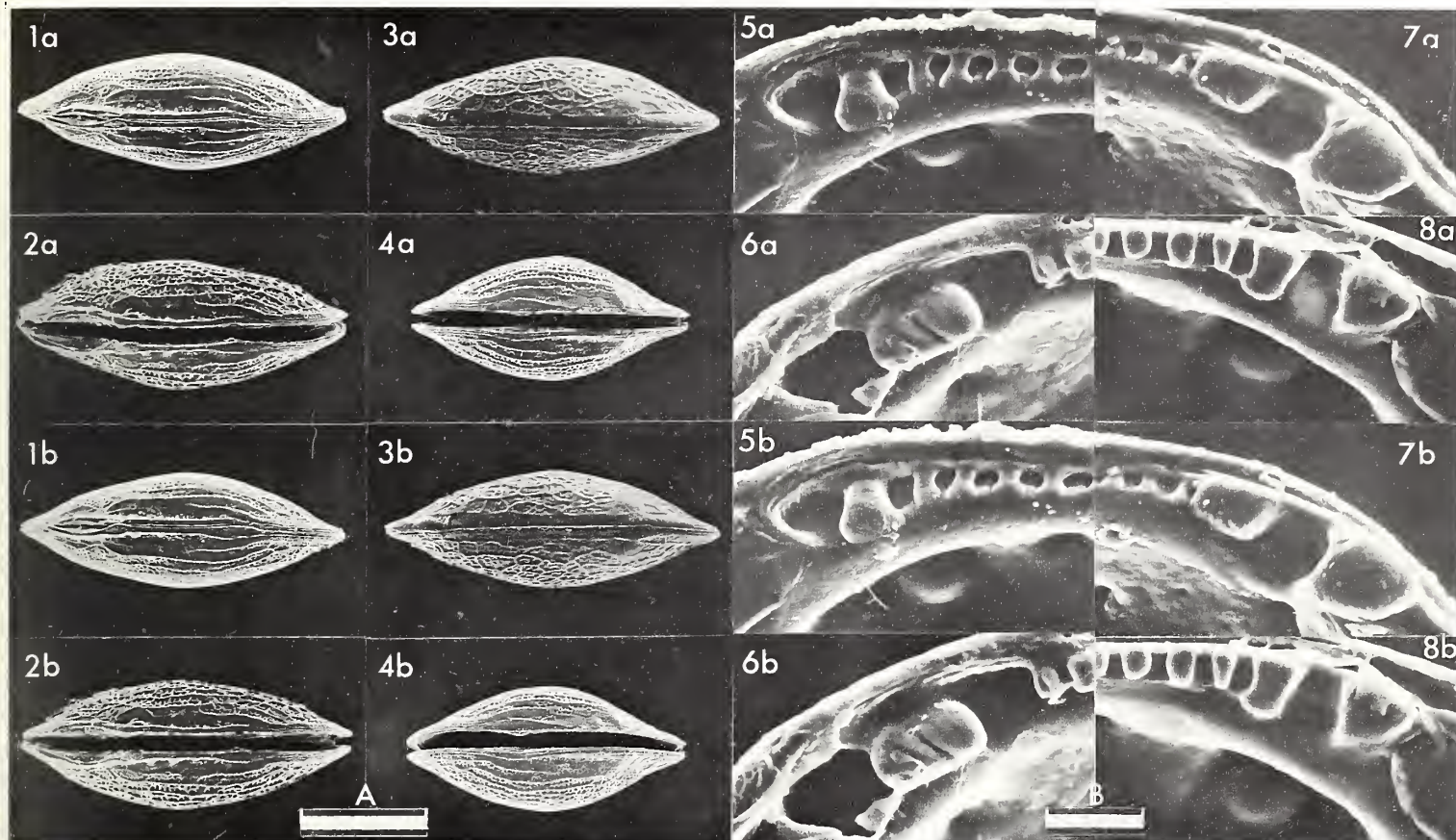
Explanation of Plate 4, 124

Fig. 1, ♀ car., ext. vent. (1976.725, 659 μm long); fig. 2, ♂ car., ext. vent. (valves gaping) (1976.726, 659 μm long); fig. 3, ♂ car., ext. dors. (1976.727, 634 μm long); fig. 4, ♀ car., ext. vent. (valves gaping) (1976.728, 537 μm long); figs. 5, 7, ♂ RV, terminal hinge elements (1976.723); figs. 6, 8, ♂ LV, terminal hinge elements (1976.729). Scale A (250 μm; x 69), figs. 1 - 4; scale B (25 μm; x 540), figs. 5 - 8.



Explanation of Plate 4, 126

Fig. 1, ♀ RV, ext. lat. (specimen with coarse ornament) (1976.724, 537 μm long); fig. 2, ♀ LV, post. vent. region showing proboli (1976.721); fig. 3, ♂ LV, int. musc. sc. (1976.722). Scale A (250 μm; x 69), fig. 1; scale B (50 μm; x 385), fig. 2; scale C (50 μm; x 540), fig. 3.



ON *COSTA TRUDIS* AHMAD sp. nov.

by Manzoor Ahmad
(University of Hull, England)

Costa trudis sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) coll. no. **OS 7692**, ♂ LV. [Paratypes: Brit. Mus. (Nat. Hist.) coll. nos. **OS 7693** - **OS 7709**].

Type locality: Stream SW of Mtwero, Tanzania, from sample no. FCRM 2010; approx. lat. 10° S, long. 39° E. Miocene.

Derivation of name: Latin *trudis* = pointed pole. A reference to the pointed posterior end and pole-like slender shape.

Figured specimens: Brit. Mus. (Nat. Hist.) coll. nos. **OS 7692** (♂ LV: Pl. 4, 128, fig. 1), **OS 7693** (♂ RV: Pl. 4, 128, fig. 2; Pl. 4, 130, fig. 1), **OS 7694** (♀ LV: Pl. 4, 130, fig. 2), **OS 7695** (♀ RV: Pl. 4, 130, fig. 3). All from the type locality.

Explanation of Plate 4, 128

Fig. 1, ♂ LV, ext. lat. (holotype, **OS 7692**, 856 µm long); fig. 2, ♂ RV, ext. lat. (paratype, **OS 7693**, 852 µm long).
Scale A (100 µm; x 112), figs. 1, 2.

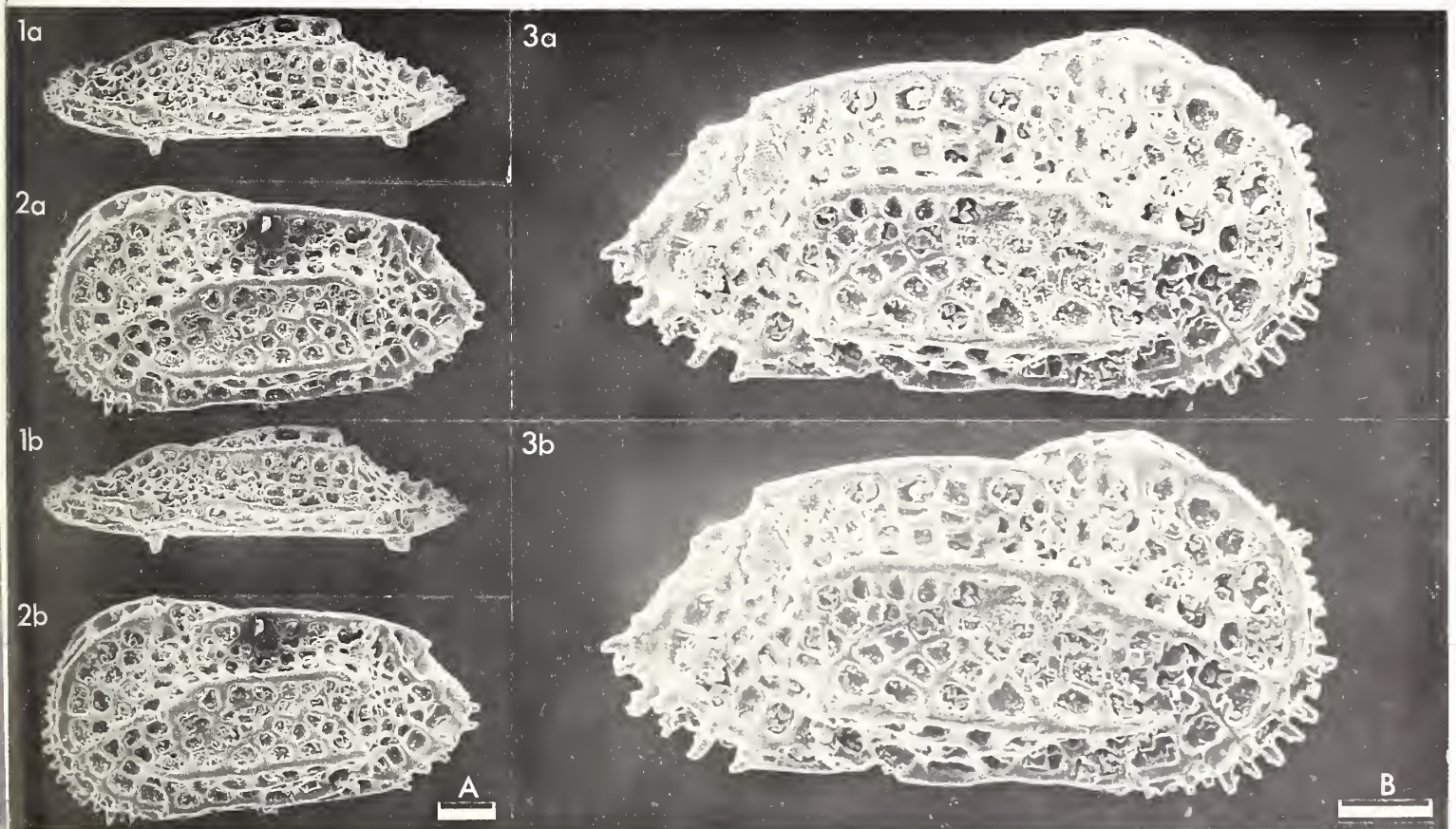
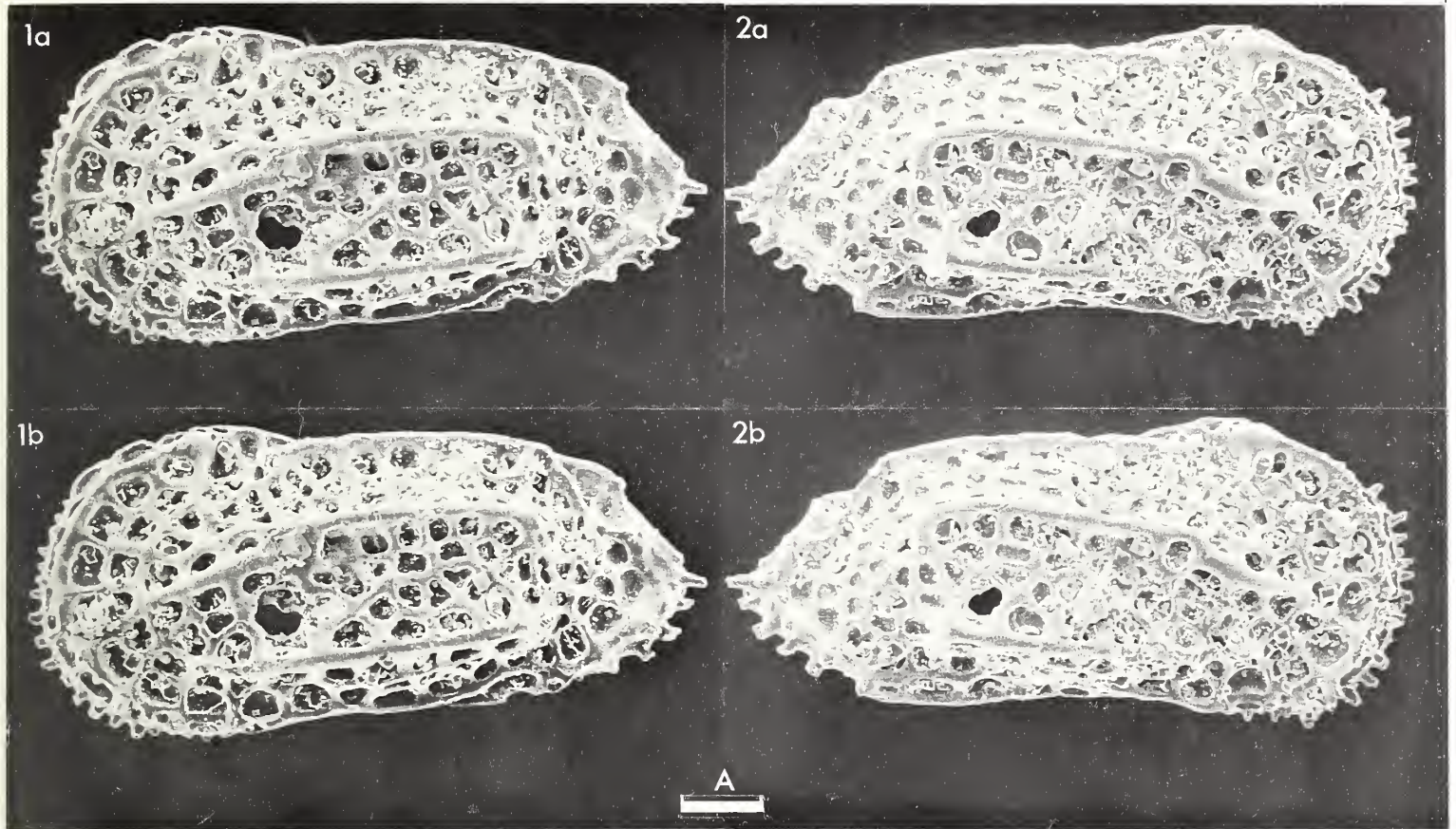
Diagnosis: A strongly reticulate species with the median ridge stepped in the anterior half. Posteriorly acuminate at about mid-height.

Remarks: From *Costa punctatissima punctatissima* Ruggieri, 1962 the new species can be distinguished by its more acuminate posterior and lack of a marginal rim. *Costa variabilicosta muhlemanni* van den Bold, 1966 is also very similar but the three-pronged ridge which runs vertically from the middle of the median rib to the ventral rib is missing in *C. trudis* and there are other differences of ornamental detail.

Distribution: Aquitanian - Burdigalian, Miocene. Not so far found outside Tanzania.

Explanation of Plate 4, 130

Fig. 1, ♂ RV, ext. dors. (paratype, **OS 7693**, 852 µm long); fig. 2, ♀ LV, ext. lat. (paratype, **OS 7694**, 824 µm long); fig. 3, ♀ RV, ext. lat. (paratype, **OS 7695**, 822 µm long).
Scale A (100 µm; x 73), figs. 1, 2; scale B (100 µm; x 124), fig. 3.



ON *OMMATOKRITHE PROLATA* AHMAD gen. et sp. nov.

by Manzoor Ahmad
(University of Hull, England)

Genus *OMMATOKRITHE* gen. nov.

Type-species: *Ommatokrithe prolata* sp. nov.

Derivation of name: Greek *omma*, *ommatos*, eye + *krithe*, the genus (Greek for 'barley'). Gender, feminine.

Diagnosis: Lateral surface with a distinct glassy eye tubercle just below the anterodorsal cardinal angle. Hinge adont with a groove in the left valve widening towards the front and slightly locellate in the posterior quarter. Normal pores are of sieve type.

Remarks: So far all known genera in the family Krithidae are blind. The new genus, although identical in other features to *Krithe* Brady, Crosskey & Robertson, 1874, can easily be distinguished by its distinct eye tubercle.

Explanation of Plate 4, 132

Fig. 1, ♀ LV, ext. lat. (holotype, OS 7768, 744 µm long). Figs. 2, 3, ♂ LV (paratype, OS 7769, 780 µm long): fig. 2, ext. lat.; fig. 3, hinge.

Scale A (200 µm; x 128), fig. 1; scale B (200 µm; x 123), fig. 2; scale C (100 µm; x 260), fig. 3.

Ommatokrithe prolata sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) coll. no. OS 7768, ♀ LV. [paratypes: Brit. Mus. (Nat. Hist.) coll. nos. OS 7769 - OS 7771].

Type locality: S Mtwero, in sisal waste gully, Tanzania; lat. 9° 55'S, long. 39° 44'E. Miocene.

Derivation of name: Latin *prolatus* = elongated.

Diagnosis: A species with 14 anterior marginal pore canals, all except one concentrated anteroventrally and three along the mid-ventral margin. Sexual dimorphism is present.

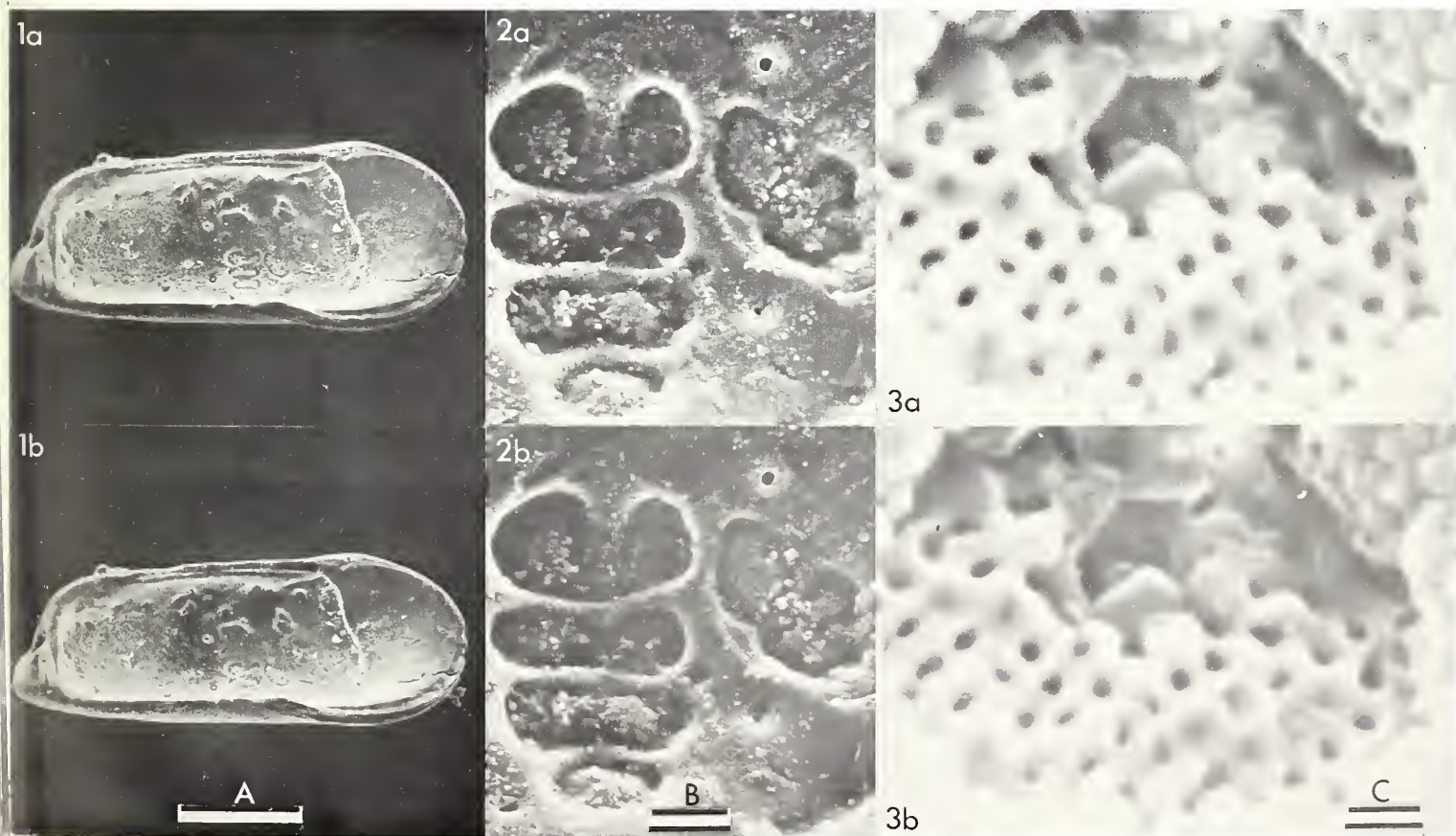
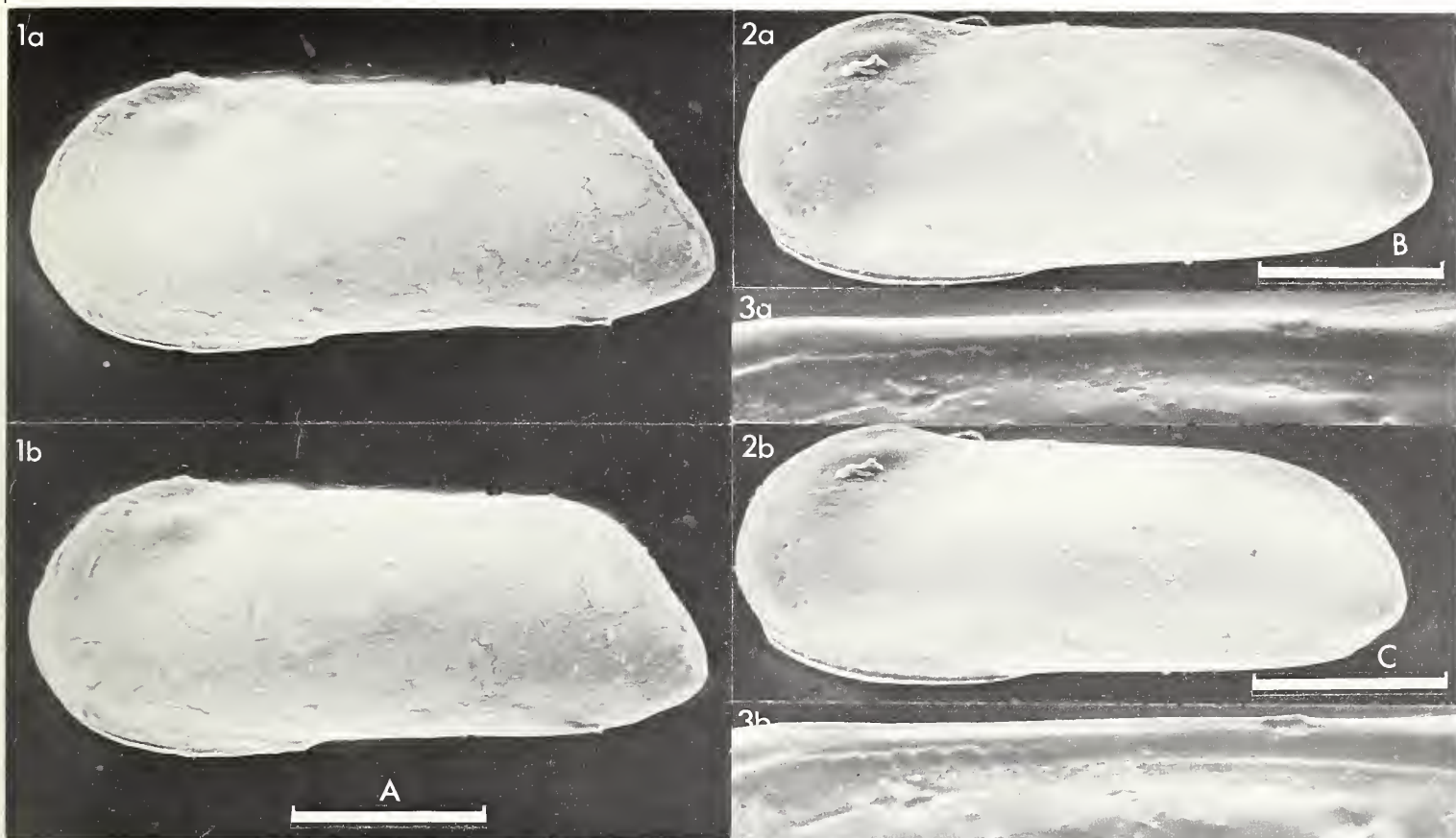
Figured specimens: Brit. Mus. (Nat. Hist.) coll. nos. OS 7768 (♀ LV: Pl. 4, 132, fig. 1), OS 7769 (♂ LV: Pl. 4, 132, figs. 2, 3), OS 7770 (♂ LV: Pl. 4, 134, figs. 1 - 3).

Distribution: Only so far found in the Aquitanian-Burdigalian (Miocene) of Tanzania.

Explanation of Plate 4, 134

Figs. 1 - 3, ♂ LV (paratype, OS 7770, 780 µm long): fig. 1, int. lat.; fig. 2, musc. sc.; fig. 3, sieve-type pore canals.

Scale A (200 µm; x 82), fig. 1; scale B (20 µm; x 550), fig. 2; scale C (1 µm; x 10,000), fig. 3.



ON *STRAVIA CROSSATA* NEALE

by John W. Neale
(University of Hull, England)

Genus *STRAVIA* Neale, 1962

Type-species (by original designation): *Stravia crossata* Neale, 1962

Diagnosis: Subtrigonal carapace, left valve strongly overlapping right valve. Marked sexual dimorphism. 16 - 17 straight radial pore canals anteriorly, 20 - 21 posteriorly. Well-developed merodont hinge overlain by an accommodation groove in the left valve. Scattered normal pore canals well seen on the inside of the valve (Pl. 4, 138, fig. 3). Frontal scar may be interpreted as a single, triangular, hook-shaped scar opening anteroventrally or as a larger dorsal with smaller, contiguous ventral scar.

Remarks: Assigned to the Eucytherinae on the basis of shape, muscle scar pattern, marginal areas and normal pore canals.

Explanation of Plate 4, 136

Fig. 1, ♂ RV, ext. lat. (HU.1.C.27.16, 714 µm long); fig. 2, ♀ RV, ext. lat. (holotype, HU.1.C.12.72, 624 µm long).
Scale A (100 µm; x 140), fig. 1; scale B (100 µm; x 155), fig. 2.

Stravia crossata Neale, 1962

1962 *Stravia crossata* sp. nov. J.W. Neale, *Micropaleontology* 8, 435, 436, pl. 2, figs. 17, 18, pl. 3, figs. 1 - 6.

1967 *Stravia crossata* Neale: J. Szejn, *Biul. Inst. geol.* 211, 85, 86.

Holotype: University of Hull coll. no. HU.1.C.12.72, ♀ RV.

Type locality: Coastal Section, Speeton Clay, Speeton, E Yorks, England; lat. 54° 10'N, long. 0° 14'40"W. Valanginian, Lower Cretaceous.

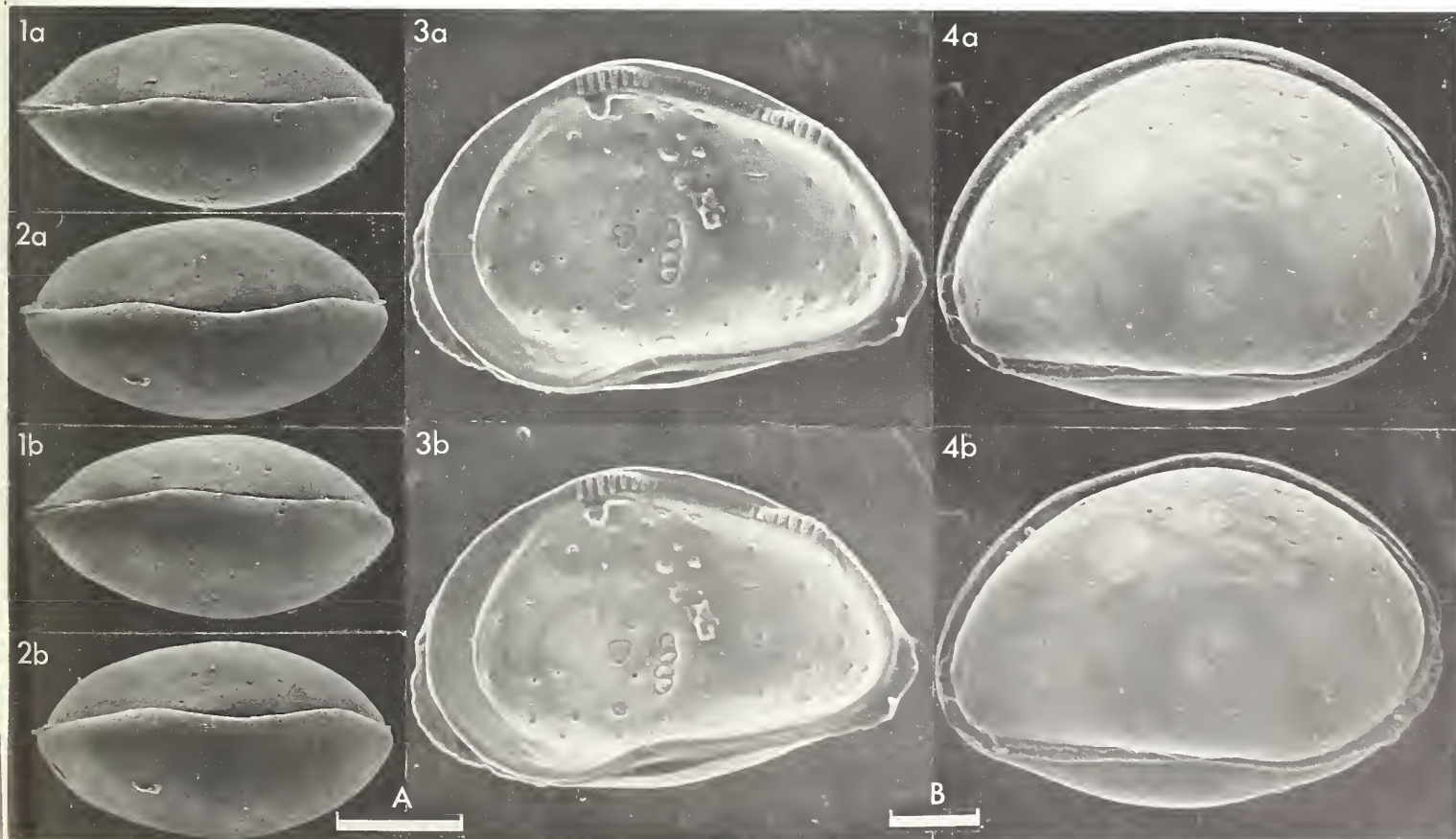
Figured specimens: University of Hull coll. nos. HU.1.C.27.16 (♂ RV: Pl. 4, 136, fig. 1), HU.1.C.12.72 (♀ RV, holotype: Pl. 4, 136, fig. 2), HU.1.C.27.8 (♂ car.: Pl. 4, 138, fig. 1), HU.1.C.27.2 (♀ car.: Pl. 4, 138, fig. 2), HU.1.C.27.11 (♀ RV: Pl. 4, 138, fig. 3), HU.1.C.12.73 (♀ car. paratype: Pl. 4, 138, fig. 4). All specimens from the type locality. Holotype and paratype from Bed D3, between 1 - 2ft above the base. Other specimens from Bed D2E, 1ft 6in above the base.

Diagnosis: As for the genus, with marginal flange-like structures developed anteriorly and posteriorly.

Remarks: Confined to the Valanginian, this species has also been recorded from beds of this age at Wąwał Brickyard in Central Poland.

Explanation of Plate 4, 138

Fig. 1, ♂ car., ext. dors. (HU.1.C.27.8, 616 µm long); fig. 2, ♀ car., ext. dors. (HU.1.C.27.2, 604 µm long); fig. 3, ♀ RV, int. lat. (HU.1.C.27.11, 612 µm long); fig. 4, ♀ car., ext. rt. lat. (paratype, HU.1.C.12.73, 616 µm long).
Scale A (200 µm; x 84), figs. 1, 2; scale B (100 µm; x 116), figs. 3, 4.



ON *CYPRIS LATISSIMA* (G. W. MÜLLER)

by John W. Neale
(University of Hull, England)

Cypris latissima (G.W. Müller, 1898)

1898 *Eurycypris latissima* n. sp. G.W. Müller, *Abh. senckenb. naturforsch. Ges.* 21, 264, pl. 13, figs. 15 - 21.

1912 *Cypris latissima* (G.W. Müller); G.W. Müller, *Ostracoda, Das Tierreich* 31, 179.

? 1964 *Cypris latissima* (G.W. Müller); G. Hartmann, *Asiatische Ostracoden, Int. Rev. ges. Hydrobiol. Hydrogr.*, 92, 145, fig. 33.

Type locality: Madagascar. Recent.

Figured specimens: University of Hull. coll. nos. **HU.240.R.13** (♀ car.: Pls. 4, 140, 142), **HU.240.R.3, 4, 11b, 12b**, (♀ limbs). All specimens from the reservoir Rembewewa, near Nochiyagama, Sri Lanka, c. lat. 8°16'N, long. 80°12'E.

Remarks: This species is easily recognised by its almost circular outline in dorsal view, its flat ventral surface and its very thin and delicate shell. The latter raises difficulties in S.E.M. work. After a number of specimens had disintegrated *in vacuo*, success was only obtained by using a carapace with the complete animal inside. This thinness of shell is well seen in the three figures of Plate 4, 142. Males of this species have never been found.

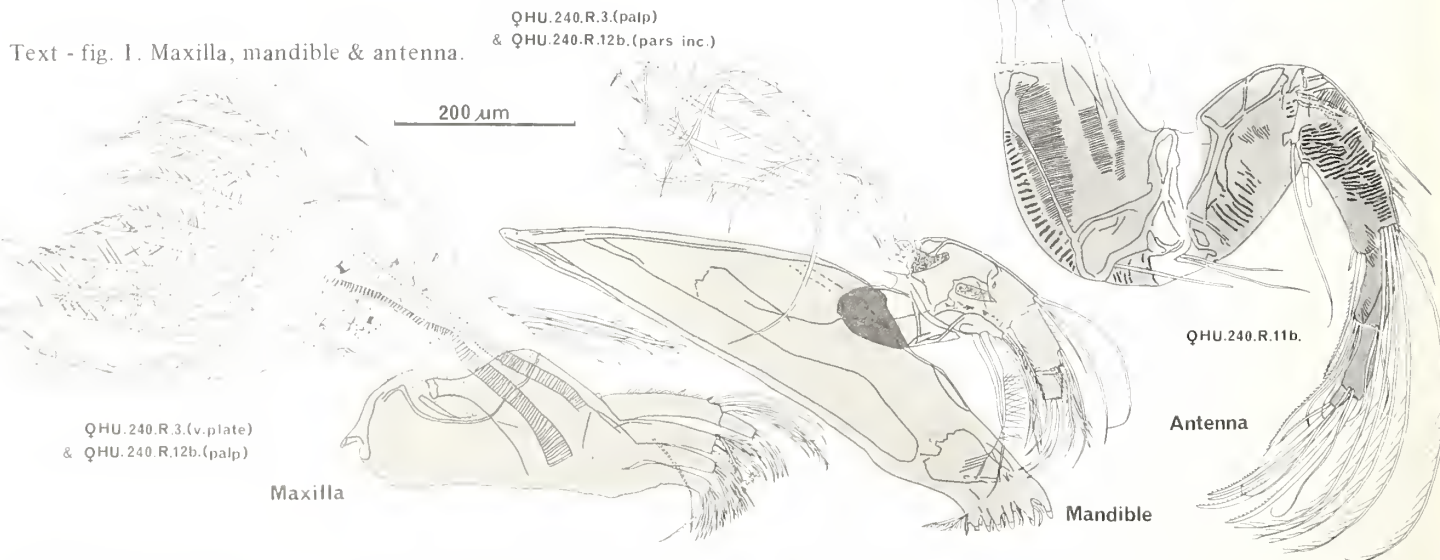
Distribution: Originally described from Madagascar by G.W. Müller, Hartmann (1964) confirmed its occurrence in Madagascar material from Tamatave and also recorded it in samples from two localities in Hyderabad, India. However, Reginald Victor, who has worked extensively on the Indian fauna, informs me that he considers that Hartmann's form is not conspecific with Müller's species.

Explanation of Plate 4, 140

Figs. 1 - 3, ♀ car. (HU.240.R.13, 1480 µm long): fig. 1, ext. from rt. & slightly dorsal; fig. 2, egress of antennules; fig. 3, ext. post.

Scale A (500 µm; x 53), figs. 1, 3; scale B (20 µm; x 600), fig. 2.

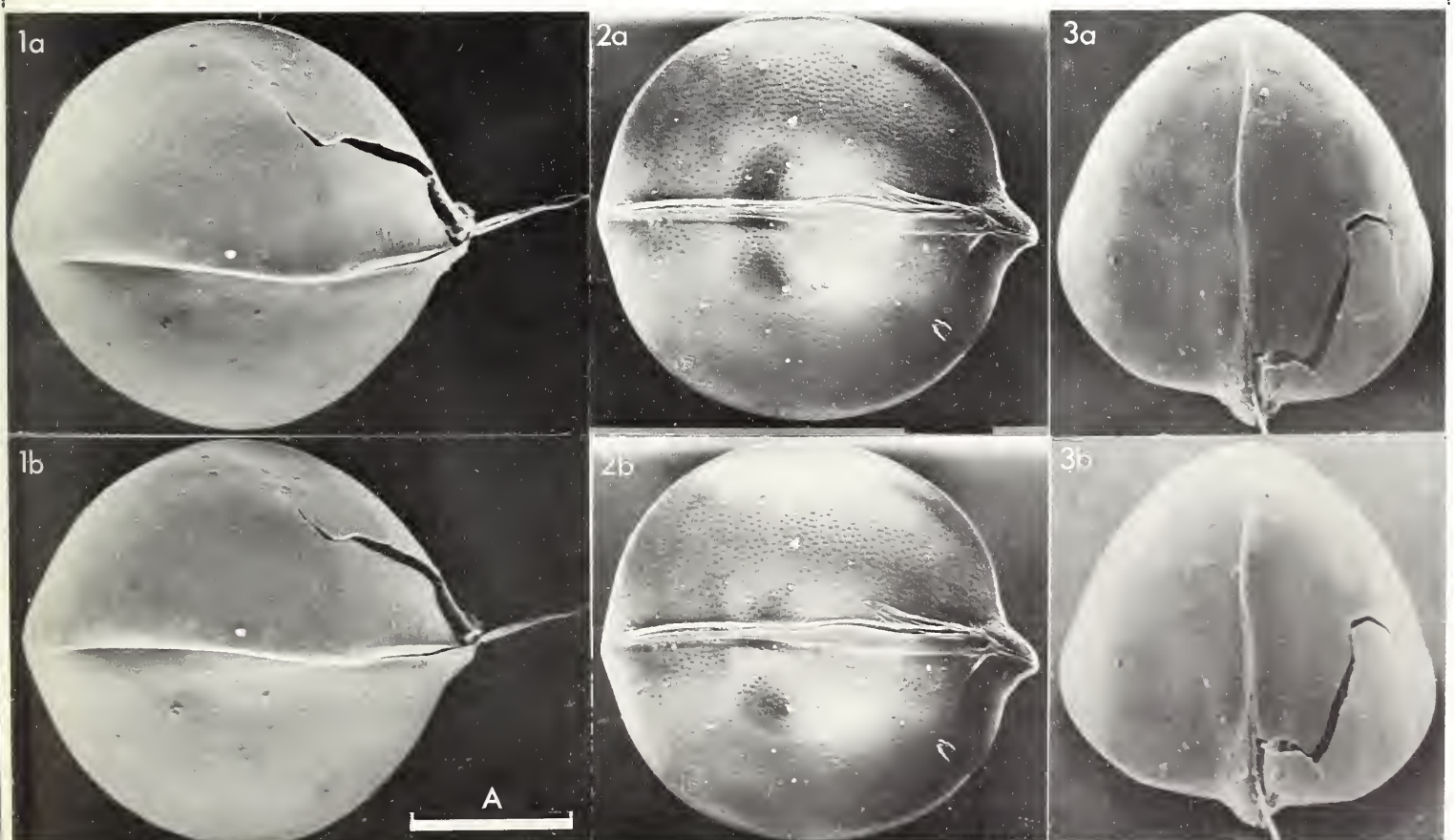
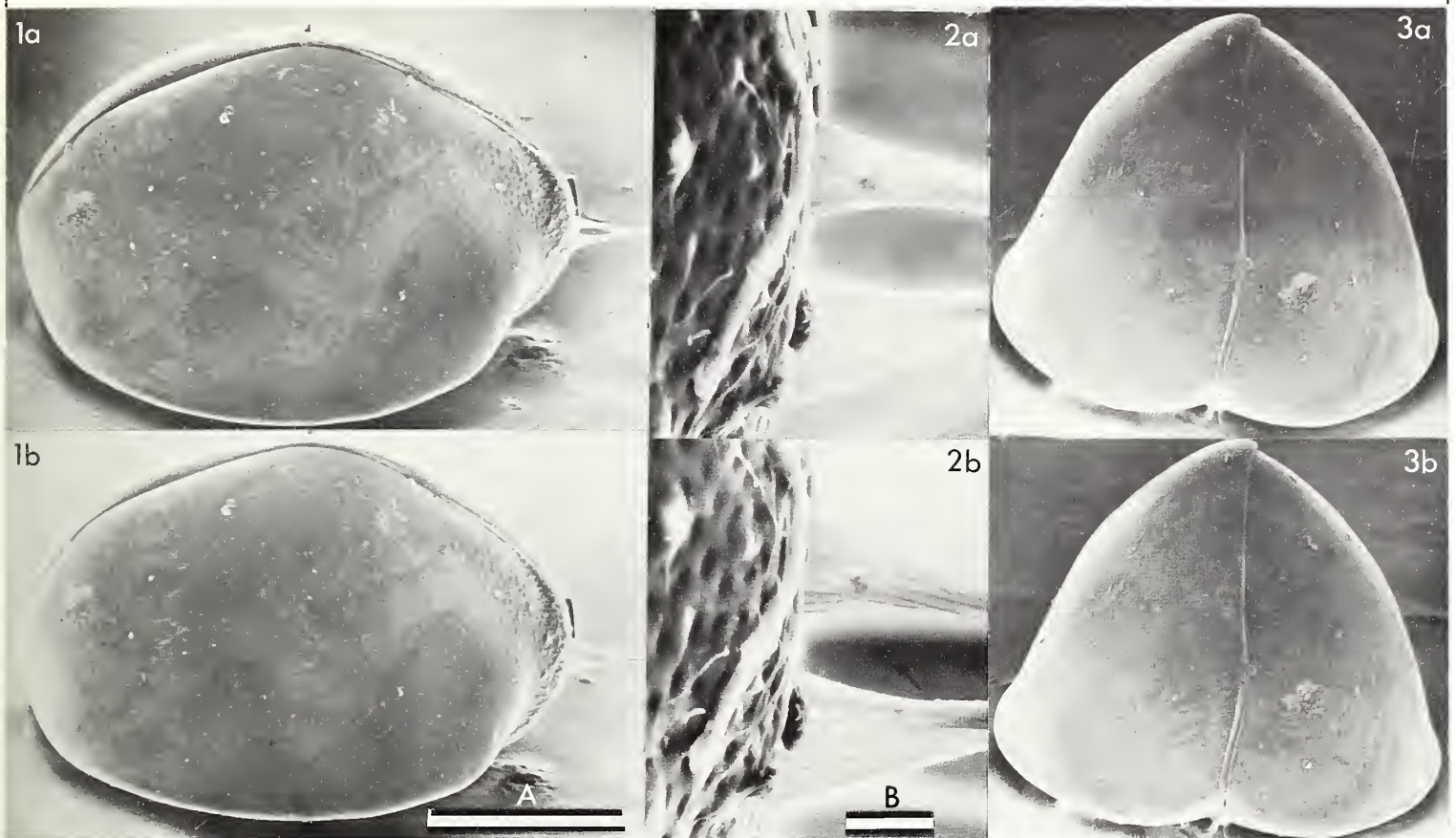
Distribution: Brehm [1939 *Rev. Zool. Bot. afr.* 22 (1)] recorded *C. cf. latissima* from the Belgian Congo. Its presence (contd.) has recently been confirmed in the Sudan. From collections covering the whole of Sri Lanka, *C. latissima* has only been found in three samples from a single locality near Nochiyagama. Here it was common and associated with *Heterocypris dentatmarginatus* (Baird), *Oncocypris pustulosa* Gurney and *Stenocypris major* (Baird). In size the Sri Lanka material is closer to the Indian material (length 1.52 mm) than the Madagascar material (2 mm).

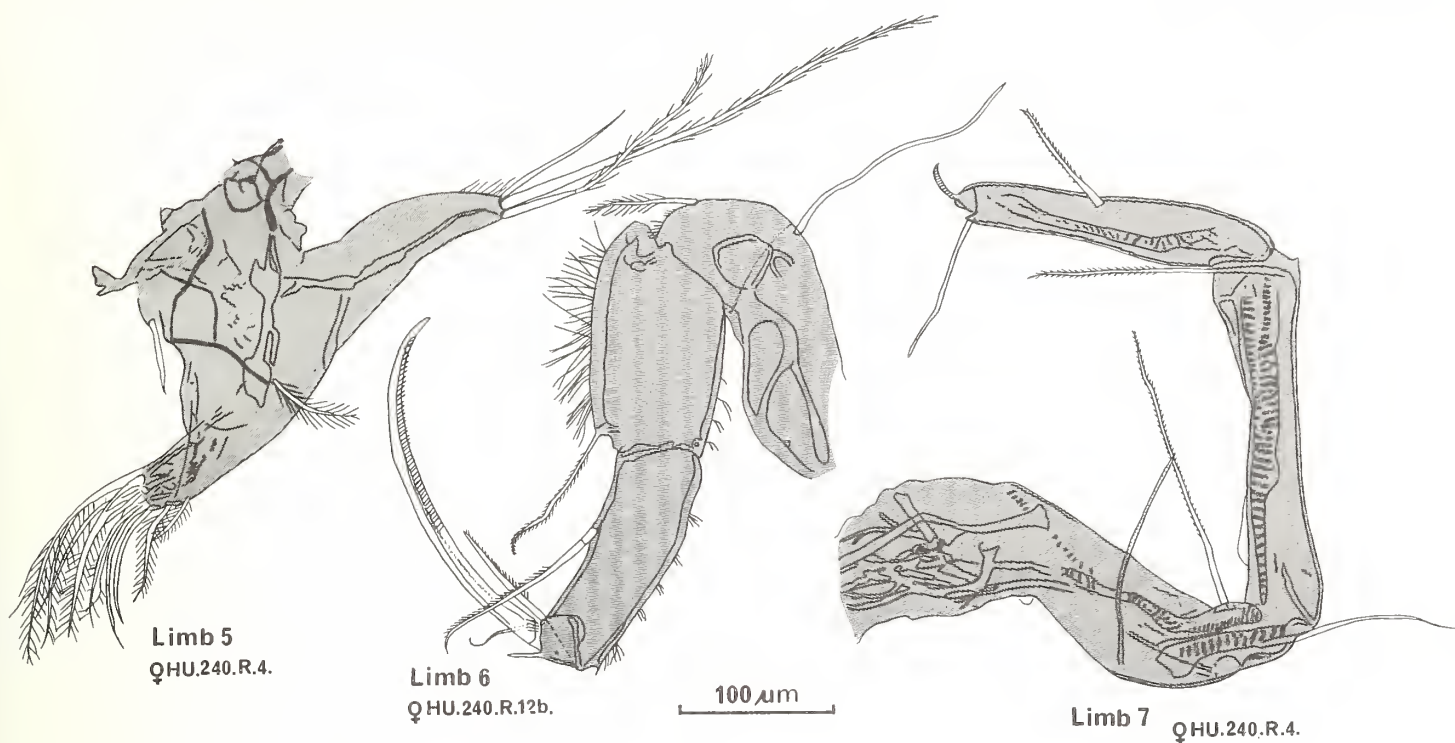


Explanation of Plate 4, 142

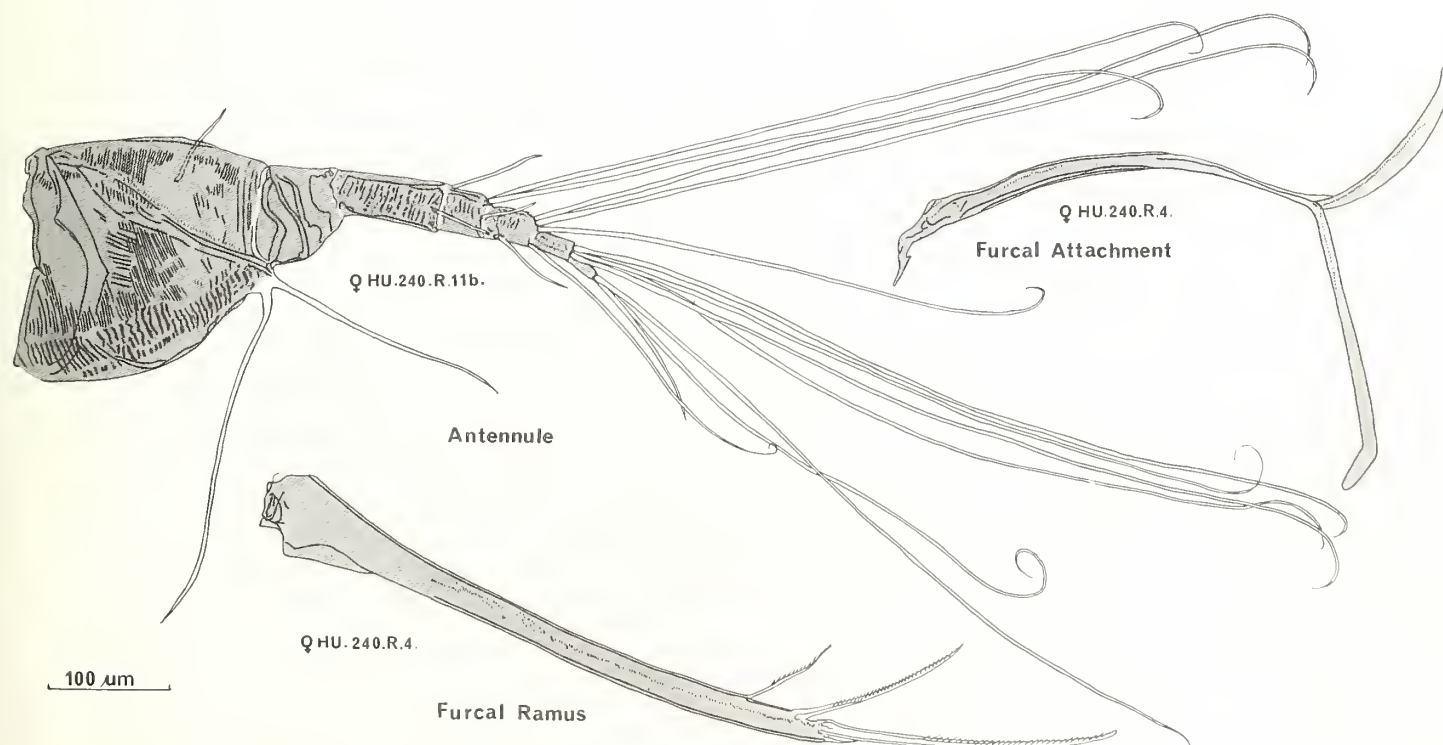
Figs. 1 - 3, ♀ car. (HU.240.R.13): fig. 1, ext. dors.; fig. 2, ext. vent.; fig. 3, ext. ant. obl.

Scale A (500 µm; x 42), figs. 1 - 3.





Text - fig. 2. Limbs 5, 6, & 7.



Text - fig. 3. Antennule, furcal ramus & furcal attachment.

ON *CYTHERELLA* (*CYTHERELLOIDEA*) *GLYPTA* DORUK sp. nov.

by Neriman Doruk
(University of Ege, Izmir, Turkey)

Cytherella (*Cytherelloidea*) *glypta* sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) **IO 5765**, ♂ LV.

Type locality: A road section 6 km E of Salbaş, Adana region of Turkey; approx. lat. 37° 07'N, long. 35° 12'E. Upper Miocene; grey marl intercalated with sandstone. Presumed shallow marine.

Derivation of name: From the Greek 'carved', referring to the nature of the reticulum.

Explanation of Plate 4, 146

Fig. 1, ♀ RV, ext. lat. (specimen lost, 740 µm long); fig. 2, ♂ LV, ext. lat. (holotype, **IO 5765**, 730 µm long); fig. 3, detail of surface reticulum (holotype, **IO 5765**).

Scale A (250 µm; x 113), figs. 1, 2; scale B (20 µm; x 791), fig. 3.

Figured specimens: Brit. Mus (Nat. Hist.) **IO 5765** (♂ LV: Pl. 4, 146, figs. 2, 3; Pl. 4, 148, fig. 1); from the base of the section at the type locality. The specimen (♀ RV) figured in Pl. 4, 146, fig. 1 and Pl. 4, 148, fig. 2 has been lost after preparation and photography; from a road cutting 5 km E of Salbaş, Adana region, Turkey; approx. lat. 37° 07'N, long. 35° 10'E.

Diagnosis: Depression in centre with longitudinal reticulum, minutely foveolate solae (see Pl. 4, 146, fig. 3).

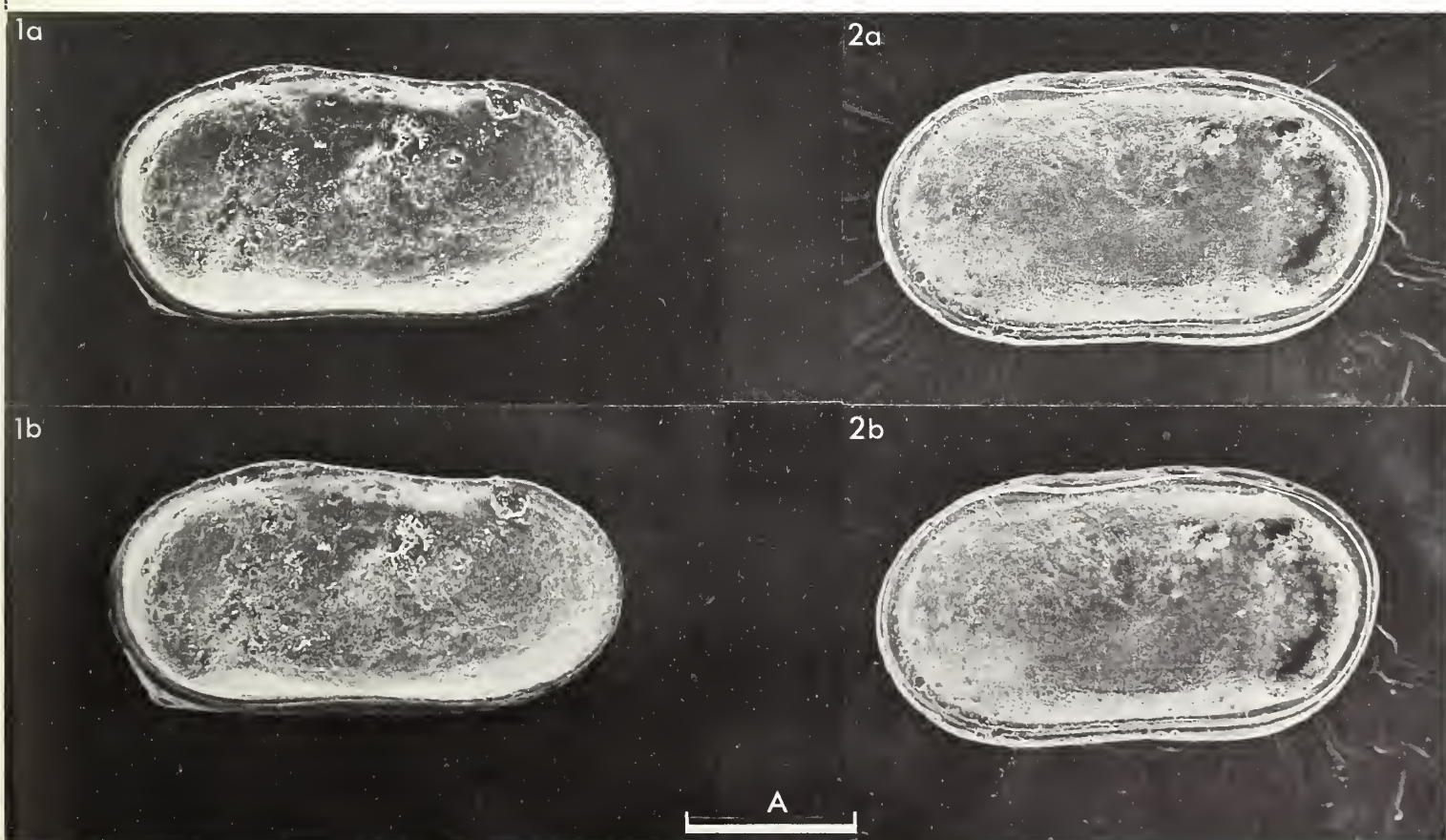
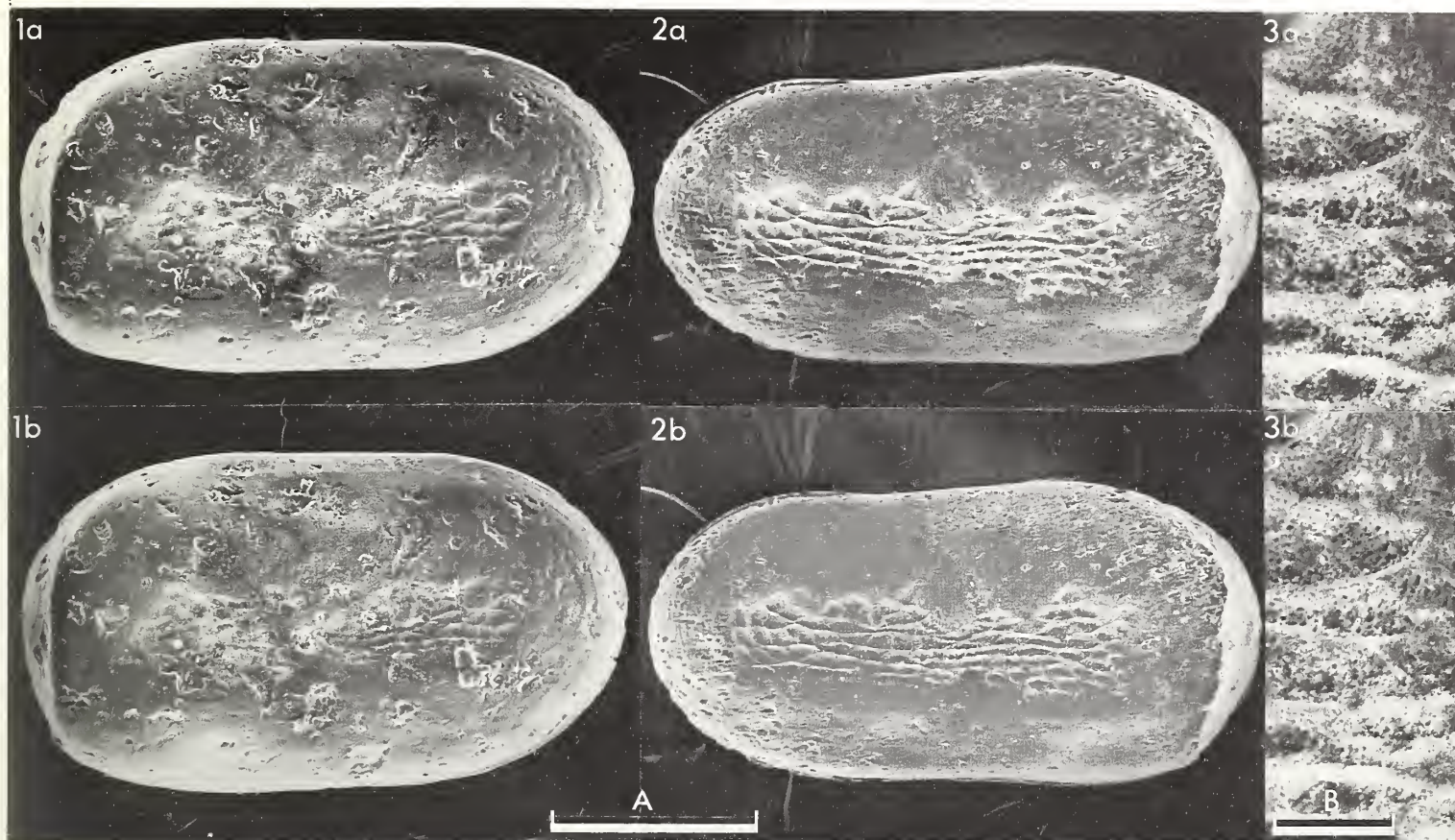
Remarks: Ornament and area of central depression variable. Sexual dimorphism is pronounced; males are longer and less high (see Pl. 4, 146, figs. 1, 2). Very similar in shape to *C. (C.) scarabaeus* sp. nov. (see *Stereo-Atlas of Ostracod Shells* 4, 149 - 152, 1977). Differs in ornament.

Distribution: Known from Upper Miocene deposits of the Adana basin, Turkey.

Explanation of Plate 4, 148

Fig. 1, ♂ LV, int. lat. (holotype, **IO 5765**); fig. 2, ♀ RV, int. lat. (specimen lost, 740 µm long).

Scale A (250 µm; x 95), figs. 1, 2.



ON *CYTHERELLA* (*CYTHERELLOIDEA*) *SCARABAEUS* DORUK sp. nov.

by Neriman Doruk
(University of Ege, Izmir, Turkey)

Cytherella (*Cytherelloidea*) *scarabaeus* sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) **IO 5764**, LV.

Type locality: A road section 1km SW of Babatorun, Antakya area of Turkey; approx. lat. 36° 04'N, long. 36° 15'E. Uppermost Miocene; yellow sandstone with abundant molluscan shell fragments and some foraminifera. Presumed littoral.

Derivation of name: Latin, from the fancied resemblance of the ornamental pits to negative scarabs.

Explanation of Plate 4, 150

Fig. 1, RV, ext. lat. (**IO 5763**, 910 μ m long); fig. 2, LV, ext. lat. (holotype, **IO 5764**, 890 μ m long); fig. 3, detail of surface fossae (holotype, **IO 5764**).

Scale A (250 μ m; x 90), fig. 1; scale B (250 μ m; x 88), fig. 2; scale C (20 μ m; x 704), fig. 3.

Figured specimens: Brit. Mus. (Nat. Hist.) **IO 5763** (RV : Pl. 4, 150, fig. 1; Pl. 4, 152, fig. 2), **IO 5764** (LV: Pl. 4, 150, figs. 2, 3; Pl. 4, 152, figs. 1, 3). Both specimens are from the base of the section at the type locality.

Diagnosis: Very steep posteriorly; depressed and pitted medially, with wrinkles on solae. Faint elongate reticulation around anterior and ventral margins.

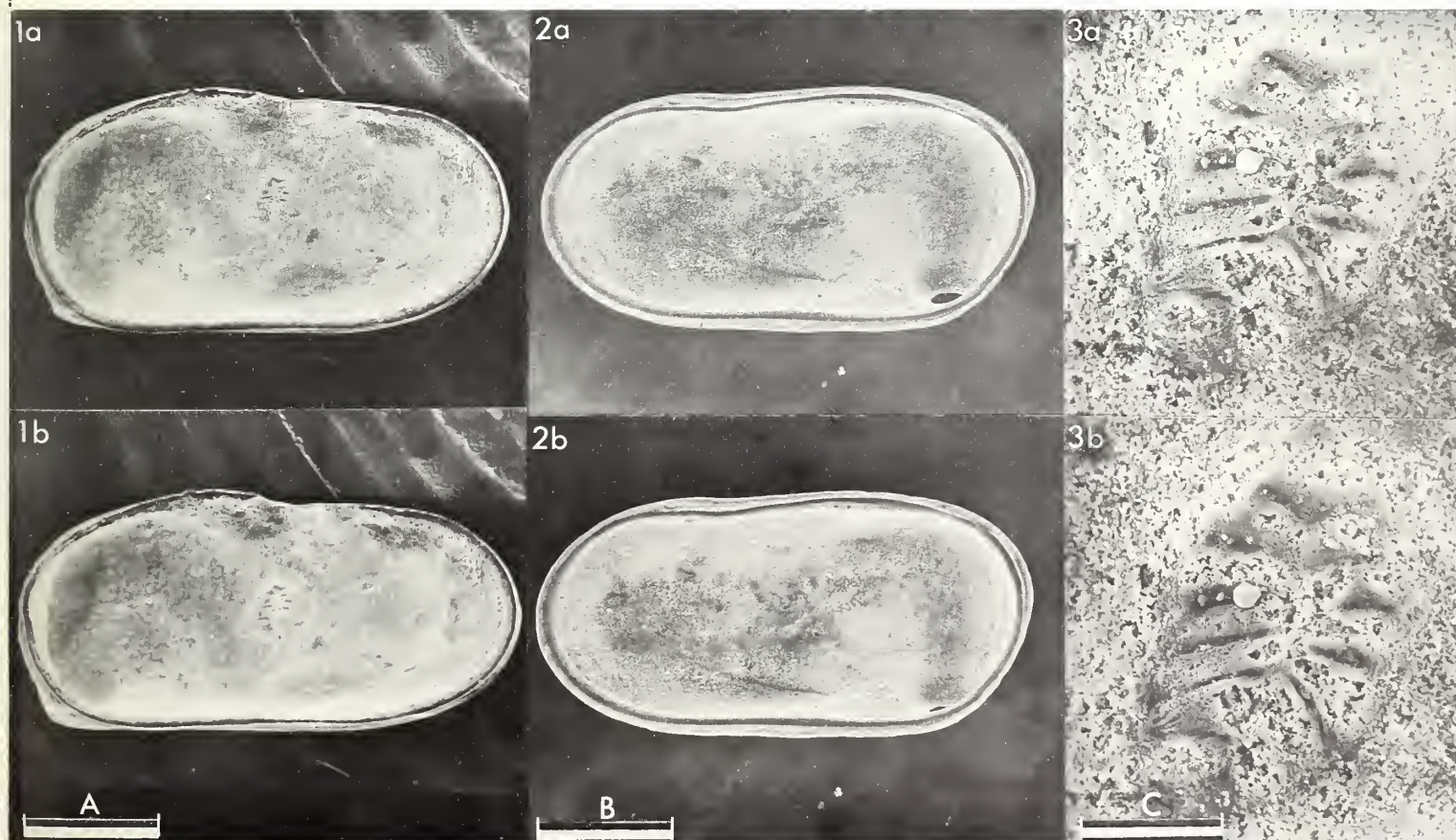
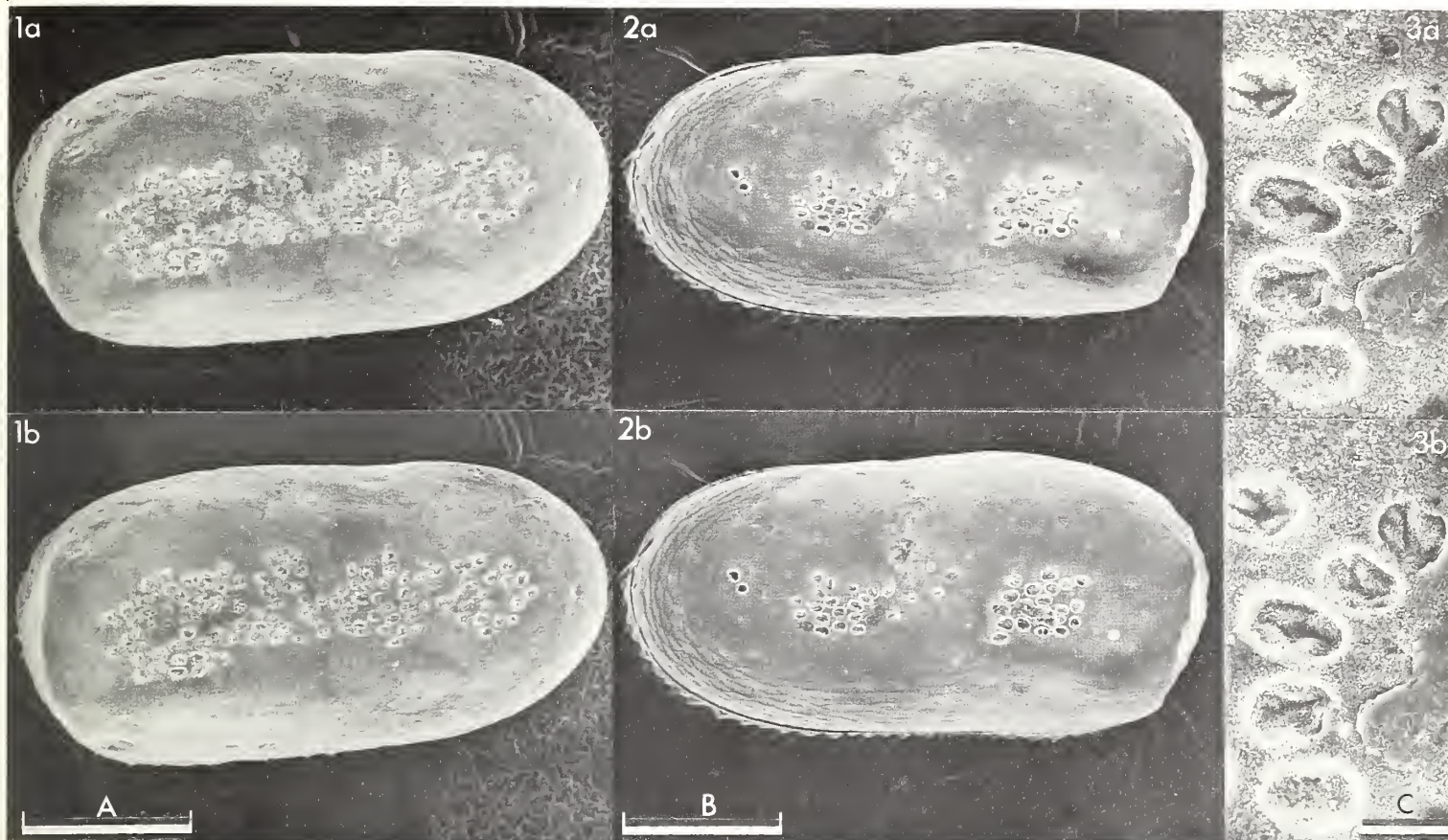
Remarks: Very similar in shape to *C. (Cytherelloidea) glypta* sp. nov. (see *Stereo-Atlas of Ostracod Shells* 4, 145 - 148, 1977.). Differs from that species in having deeply punctate rather than reticulate ornament.

Distribution: Known so far only from the type locality, Turkey.

Explanation of Plate 4, 152

Fig. 1, LV, int. lat. (holotype **IO 5764**); fig. 2, RV, int. lat. (**IO 5763**); fig. 3, LV, int. musc. sc. (holotype, **IO 5764**).

Scale A (250 μ m; x 77), fig. 1; scale B (250 μ m; x 76), fig. 2; scale C (50 μ m; x 385), fig. 3.



ON *TANZANICYTHERE* AHMAD nom. nov.

by Manzoor Ahmad
 (University of Hull, England)

Genus *TANZANICYTHERE* Ahmad nom. nov.

1977 *Cladarocythere* gen. nov. M. Ahmad, *A Stereo-Atlas of Ostracod Shells* 4, 45.

Type-species (by original designation): *Cladarocythere pterota* Ahmad, 1977

Derivation of name: From its country of origin, Tanzania.

Remarks: In a recent paper in *A Stereo-Atlas of Ostracod Shells* (1977, 4, 45 - 48) I established the generic name *Cladarocythere* (type-species by original designation *Cladarocythere pterota* Ahmad, 1977). Dr. J.P. Colin has kindly pointed out (pers. comm.) that *Cladarocythere* is preoccupied by *Cladarocythere* Keen, 1972 (Ostracoda).

I therefore propose the name *Tanzanicythere* nom. nov. to replace the junior homonym *Cladarocythere* Ahmad, 1977.

Tanzanicythere pterota (Ahmad, 1977)

1977 *Cladarocythere pterota* sp. nov. M. Ahmad, *A Stereo-Atlas of Ostracod Shells* 4, 45 - 48.

Stereo-Atlas of Ostracod Shells

Abbreviations

ant.	anterior, antero-
Brit. Mus. (Nat.Hist.)	} British Museum (Natural History)
BM (NH)	
car.	carapace
dors.	dorsal, dorsum, dorso-
ext.	external
int.	internal
juv.	juvenile, instar
juv - 1	(penultimate instar)
lat.	lateral
lr.	lower
lt.	left.
LV	left valve
mag.	magnification
musc. sc.	muscle scar
Grid Ref.	National Grid Reference
obl.	oblique
post.	posterior, postero-
rt.	right
RV	right valve
sp.	species
spec.	specimen
up.	upper
vent.	venter, ventral, ventro-
♀	female
♂	male

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